Alberta

species at risk

PROGRAM AND PROJECTS

2002-2003

Alberta
SUSTAINABLE RESOURCE DEVELOPMENT
Fish & Wildlife

Alberta
Species at Risk
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executive summary

The fiscal year 2002-2003 (April 2002 – March 2003) marks the third year of enhanced funding to kickstart the Alberta Species at Risk Program. The program continues to evolve, and the focus in 2002-2003 turned to recovery planning and recovery plan implementation. This shift followed naturally on the previous two years, during which many inventory and monitoring projects were funded and completed. Continued species evaluations by the Scientific Subcommittee, and corresponding recommendations from the Endangered Species Conservation Committee to the Minister of Sustainable Resource Development, have identified additional species for which directed planning and management efforts are necessary to bring about species and habitat recovery. In total, thirty projects, and recovery planning and implementation for 13 species, were continued or initiated in 2002-2003.

Involvement of affected and interested stakeholders is integral to the success of recovery planning and implementation initiatives. Stakeholder participation on recovery teams in 2002-2003 was outstanding. Engagement of stakeholders in the recovery planning and implementation processes, and through the Endangered Species Conservation Committee, continues to be a key strength of the program.

Another significant development during 2002-2003 was the initiation of the program's first multi-species, landscape-level projects—the Milk River Basin Species at Risk Conservation Project and the Special Areas Habitat Stewardship Project. Traditionally, species at risk projects in Alberta and across the country have focused on single species. This type of targeted approach is often necessary, particularly for species that are critically imperilled. However, in many cases, where natural or human-caused limiting factors influence numerous species or an entire landscape, a broader approach may be appropriate, from the perspective of both wildlife management and cost effectiveness. The establishment of these landscape-level initiatives represents an exciting new direction for the program.

An emerging influence on the program is the federal *Species at Risk Act*, which received royal assent in December 2002 and was subsequently proclaimed in June 2003. The act is binding at the federal and provincial levels and has implications for the protection and recovery of all at-risk species that occur in Alberta, particularly for those species that have been listed nationally. Provincial recovery planning for species that are listed both in Alberta and nationally will be tailored to meet federal as well as provincial requirements.

soapweed and yucca moth

introduction

This report is the third annual summary of the Alberta Species at Risk Program. The program received its third year of enhanced funding in 2002-2003 (April 2002 – March 2003). All species at risk staff positions, originally created as two-year appointments, were made permanent. This development was a tremendous boost to the program. As in previous years, the accomplishments of 2002-2003 were made possible by dedicated staff, partner contributions and cooperative efforts with many stakeholders and nongovernmental, provincial and federal agencies.

Alberta's commitment to the principles embodied in the *Accord for the Protection of Species at Risk*, and to other provincial and federal programs and initiatives, continues to be strengthened through the development of the provincial Species at Risk Program. Although inventory and monitoring projects constituted a large portion of the program in previous years, recovery planning and implementation came to the forefront during 2002-2003. The need for recovery planning and implementation of recovery actions continues to increase, and will remain a focal point of the program in the coming years.

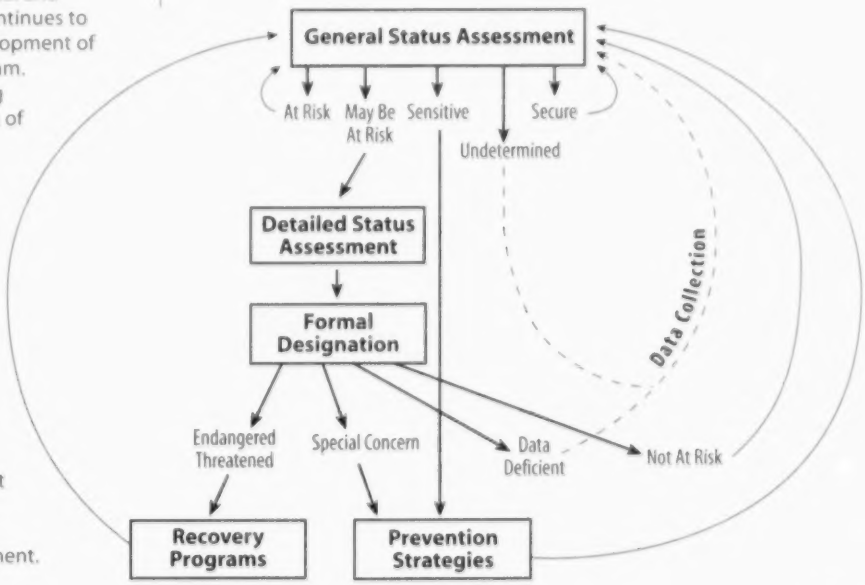
This document is intended to provide an overview of the projects and recovery efforts undertaken as part of the Species at Risk Program in 2002-2003, and to highlight staff commitment and volunteer and stakeholder involvement.

Program Framework

The Alberta Species at Risk Program is composed of five interrelated program areas:

- general status assessment of all wild species,
- detailed status assessment of species that may be at risk of extinction or extirpation in Alberta,
- formal (legal) designation of species as *Endangered* or *Threatened*, or recommendation as *Species of Special Concern*, *Data Deficient* or *Not At Risk*,
- development and implementation of recovery programs for *Endangered* and *Threatened* species, and
- development and implementation of strategies to prevent species from becoming at risk, including *Species of Special Concern* management plans.

These components are integrated so that advancements in one area, for example general status determination, lead to development and evaluation of the other components. Details on the five steps follow, and are illustrated in the accompanying figure.



1) General Status Assessment
This element is the common link for all species included in the Alberta Species at Risk Program. The general status of all wild species in Alberta, regardless of their designation, is evaluated every five years. This process acts as a coarse filter, identifying those species that require more focused attention, either for protection or accurate evaluation. Preliminary status assessments were prepared in 2000 for 4735 species of plants, vertebrates, invertebrates and fungi, expanding the scope of the general status assessment process. *The General Status of Alberta Wild Species 2000* (Alberta Sustainable Resource Development 2001) reports on butterflies, orchids, ferns, fish, birds, mammals, amphibians and reptiles, all of which have also been assessed and reported on nationally.

2) Detailed Status Assessment
Detailed status reports, which provide a comprehensive and current summary of a species' status, are prepared for species listed as *At Risk* or *May Be At Risk* at the general status level, as well as for some status *Undetermined* species. Using these reports and any additional pertinent information, an independent body of scientists, the Scientific Subcommittee (SSC) of the Endangered Species Conservation Committee (ESCC), makes detailed assessments of species at risk, using criteria developed by The World Conservation Union (IUCN). The SSC provides these results, as well as recommendations for conservation, to the ESCC. The SSC and the ESCC were created in 1997 under Alberta's *Wildlife Act*.

3) Formal Designation
The ESCC—a broad stakeholder committee including scientists, government and corporate land managers, resource-based land users and conservation organizations—evaluates the detailed status assessment prepared by the SSC and makes recommendations on legal designation, preparation of recovery plans, and conservation actions that should be undertaken immediately. These recommendations and the SSC assessment are forwarded to the Minister of Sustainable Resource Development, who has the final responsibility for legally designating species as *Endangered* or *Threatened*, and initiating recovery and conservation measures. Legal designation of birds, mammals, amphibians and reptiles as *Endangered* or *Threatened* under Alberta's *Wildlife Act* prohibits disturbance, killing, possession and trafficking of these species, and provides immediate protection for nests and dens. The *Wildlife Act* and *Wildlife Regulation* were modified in 1997 to enable the listing of fish, plants, invertebrates, algae and fungi. Regulations will need to be developed following the listing of species from these taxonomic groups, as the automatic prohibitions do not apply to them. For wildlife species that do not meet the criteria for *Endangered* or *Threatened*, new categories are being developed, including *Species of Special Concern*, *Data Deficient* and *Not At Risk*.

4) Recovery Programs
Legally protected species then enter the formal recovery planning process. The focus of a recovery program is to improve the status of the species and ensure its long-term survival in the wild, with the ultimate goal of removing the species from the endangered/threatened species list. A recovery team, composed of a variety of stakeholders specific to the species and issues involved, is formed to develop and implement a recovery plan for the species. Following legal designation, recovery plans are required within one year for *Endangered* species and within two years for *Threatened* species.

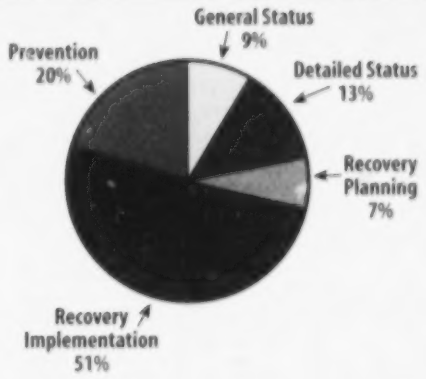
5) Prevention Strategies
As it is generally much more efficient and cost-effective to protect species before they become endangered, any species designated as a *Species of Special Concern* following detailed status evaluation, or as *Sensitive* following general status evaluation, becomes eligible for special management actions designed to prevent the species from becoming at risk. Ecological management and conservation of biodiversity are considered fundamental aspects of program delivery.

Program and Project Priorities

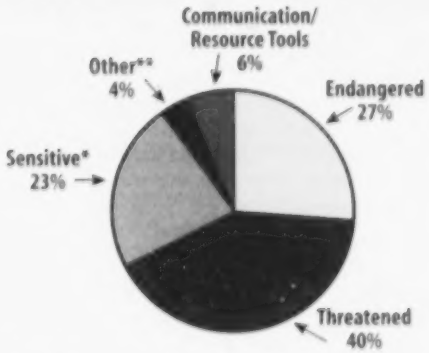
The 2002-2003 Species at Risk Program provincial budget of $367 000 was allocated to species at risk projects, SSC and ESCC operations, and recovery planning and implementation. Salary and staff operational costs were covered from funds outside the Species at Risk Program. All project proposals were critically reviewed by Species at Risk staff and ranked using an updated prioritization scheme. Recommendations from the ESCC were considered during the review process. Priority was determined using the following criteria: 1) the status of the target species (*Endangered* vs. *Threatened* vs. *Special Concern/May Be At Risk/Data Deficient* vs. *Sensitive/Undetermined* vs. other); 2) existing commitments or urgency (e.g., ministerial priority, recovery plan development, ongoing project requiring completion, national listing); and 3) the scope and impact of the proposed project (e.g., provincial vs. local scope; offering direct vs. indirect conservation benefits).

Approximately $317 000 was allocated directly to species at risk projects and recovery programs. The accompanying three charts show the breakdown of project funds by program area, risk category and taxon. The communication/resource tool category appears as a stand-alone category in the taxon and risk category graphs.

Percentage of Project Funds Directed to Program Area



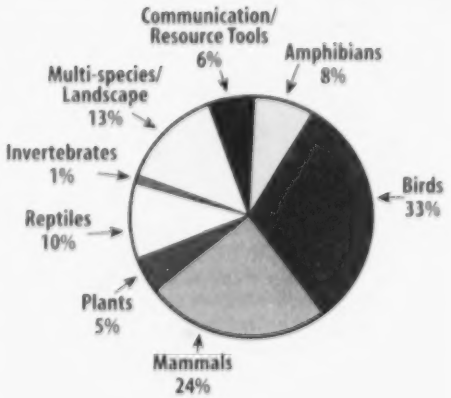
Percentage of Project Funds Directed to Risk Category



* Includes *Special Concern, May Be At Risk, Sensitive, Data Deficient*

** Includes *Secure* and species with preliminary general status ranks

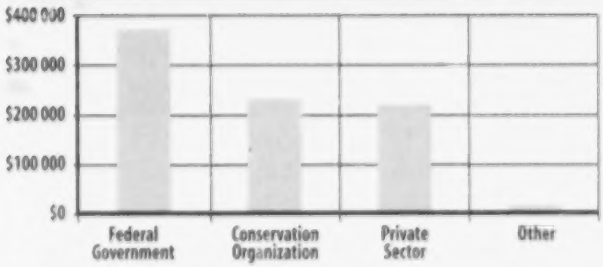
Percentage of Project Funds Directed to Taxon



Partner Funding

Funding from outside sources played a significant role in the successful delivery of projects that Fish and Wildlife Division staff coordinated, or co-led with other organizations, such as the Alberta Conservation Association. Outside funding was received from a variety of sources including the private sector, conservation or hunting-related agencies and the federal government. Partner funding totalled $826 500, and represented a 4:1 match for the Species at Risk Program allocation to jointly led projects. Many projects and all of the recovery efforts also benefited from extensive in-kind support from numerous organizations.

Partner Funding Contributed to 2002-2003 Species at Risk Projects*



*Only for projects led or jointly led by the Fish and Wildlife Division

Significant Program Developments During 2002-2003

General status efforts in 2002-2003 included literature and data compilation projects on bullsnake and Richardson's ground squirrel. In addition, the Species at Risk Program continued to support existing initiatives such as the Alberta Amphibian Monitoring Program—Researching Amphibian Numbers in Alberta, the northern Alberta bat inventory, the central Alberta western and eared grebe inventory and the central parkland mollusc survey. Additionally, preliminary status ranks that were developed for over 2000 vascular plant species in the year 2000 were updated, and are ready for review.

The priority-setting process that was developed by the SSC during 2001-2002 to sort through the large number of *May Be At Risk* vascular plants was applied with a focus on a "hotspot" in southwestern Alberta. This resulted in an inventory of two rare species of grape fern (*Botrychium* spp.) in and near Waterton Lakes National Park.

Inventory projects were also conducted for several species of management concern (e.g., short-horned lizard, wolverine, prairie rattlesnake), as well as for some species that had been assessed nationally, but not provincially (e.g., small-flowered

sand-verbena). The information collected from these projects will be used in the detailed status evaluation process. Seven detailed status reports were initiated in 2002-2003, and five were printed (including a number initiated in previous years), bringing the total number of reports published in this series to 48 since 1997. The reports started and printed in 2002-2003 covered species from a broad range of taxa, including amphibians, birds, fish, mammals and plants. This element of the program continues to be integral to the operation of the SSC and ESCC.

The ESCC completed evaluations of eight species potentially at risk in Alberta and forwarded its recommendations for these species to the Minister of Sustainable Resource Development (see table below). Also of note, the *Wildlife Regulation* was updated in May 2002 to reflect the new *Endangered* designation for Ord's kangaroo rat.

Species reviewed by the Endangered Species Conservation Committee during 2002-2003

Species	Status at Time of Assessment (2002)	Status Recommendation
Cape May Warbler (*Dendroica tigrina*)	Non-game Animal	Species of Special Concern
Bay-breasted Warbler (*Dendroica castanea*)	Non-game Animal	Species of Special Concern
Soapweed (*Yucca glauca*)	Not Listed	Endangered
Yucca Moth (*Tegeticula yuccasella*)	Not Listed	Endangered
White-winged Scoter (*Melanitta fusca*)	Migratory Game Bird	Species of Special Concern
American Badger (*Taxidea taxus*)	Fur-bearing Animal	Data Deficient
Lake Sturgeon (*Acipenser fulvescens*)	Game Fish	Deferred*
Willow Flycatcher (*Empidonax traillii*)	Non-game Animal	Deferred**

* Returned to SSC for review in late 2002-2003

** Deferred pending additional information

On the communications side, preparation began in 2002 for the second biennial report of the ESCC, due to be printed in 2003. Species accounts developed for this report will be used to create additional fact sheets (information leaflets), which will be made available on the Fish and Wildlife Division's Species at Risk web site.

Substantial progress has been made in both recovery planning and implementation in the province. The *Maintenance and Recovery Plan for Western Blue Flag* (Iris missouriensis) *in Canada* and the *Alberta Piping Plover Recovery Plan 2002-2004* were formally approved by the Minister of Sustainable Resource Development in April 2002. Following approval, the recovery programs for these two species moved fully into implementation of recovery actions. Three new recovery teams were formed for woodland caribou, grizzly bear and greater sage-grouse, while recovery planning continued for burrowing owl and peregrine falcon. Initial preparation also got underway for Ord's kangaroo rat, trumpeter swan, western spiderwort, soapweed and yucca moth, and swift fox.

Stakeholder participation has been vital to the working success of the provincial recovery teams. Although stakeholder representation varies from team to team, conservation groups, industry, land users and managers, and provincial and federal agencies are generally involved in these cooperative and consultative initiatives. For more information about Alberta recovery teams and planning efforts, see page 63.

Advances were also made in the prevention component of the Species at Risk Program. A process for preparing Conservation Management Plans for *Species of Special Concern* was developed, and draft plans were prepared for two *Special Concern* species—long-toed salamander and Sprague's pipit—and one *Data Deficient* species—prairie rattlesnake. Find out more about the conservation management plans on page 59.

Raising public awareness about the identity and needs of species at risk also played a key role in the prevention aspect of the program. One of the key methods to achieve this is direct contact with the public, and species at risk staff continued to make progress in this area. Other communication initiatives included beginning a much needed enhancement of the Alberta Species at Risk web site (see below for site address), reprinting Alberta Species at Risk postcards and documenting project progress through the Species at Risk Report series.

Perhaps one of the biggest steps in the prevention field was the initiation of two multi-species landscape-level projects—the Milk River Basin Species at Risk Conservation Project and the Special Areas Habitat Stewardship Project. Both initiatives are working toward conservation of species at risk found within a particular landscape, through voluntary stewardship actions with land users.

Provincial and National Program Integration

Alberta's approach to identifying and protecting species at risk is consistent with and parallels national efforts in this area. Alberta has taken a leadership role in the development and implementation of a national general status assessment system, and this initiative links directly to Alberta's general status assessment effort. A standard assessment protocol has been developed and adopted by all jurisdictions in Canada. This protocol will help consolidate the provincial and territorial status ranks of all wild species into national ranks at five-year intervals.

This consistency in approach continues at the detailed status assessment level. The SSC plays a role similar to that of the Committee on the Status

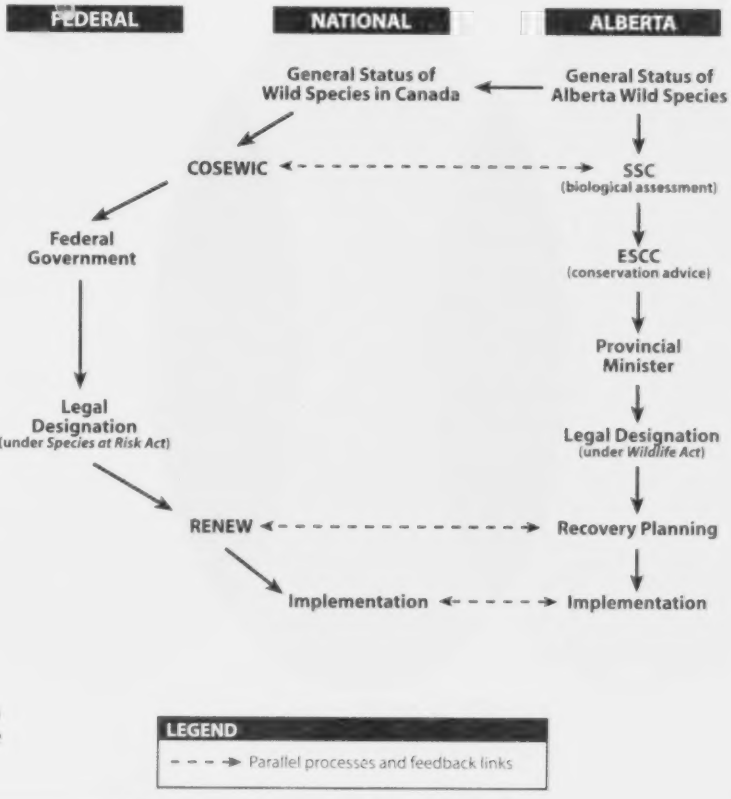
of Endangered Wildlife in Canada (COSEWIC). Both committees conduct biological assessments of species potentially at risk using criteria established by The World Conservation Union (IUCN).

The ESCC represents a unique and progressive component of Alberta's assessment process that is not found at the national level. By involving stakeholders at this stage of the legal designation process, the development of effective and viable management and recovery programs has been enhanced.

Integration of provincial and national recovery planning is essential, given requirements under the federal *Species at Risk Act* (SARA), for widely distributed species that face threats which are common across a number of jurisdictions. For example, woodland caribou recovery planning in Alberta has been designed to complement and integrate with national efforts. Where Alberta is the leading or jointly leading jurisdiction for an *Endangered* or *Threatened* species (e.g., western blue flag), provincial recovery plans will be developed to satisfy both national and provincial requirements.

Alberta also participates on most national recovery teams for species at risk that occur in the province. National recovery strategies and action plans are prepared under the auspices of the Recovery of Nationally Endangered Wildlife (RENEW) program. The RENEW program was launched in 1988 and is currently being updated with an emphasis on recovery actions. Alberta is leading the review of the RENEW Recovery Handbook (ROMAN).

Parallels between the provincial and national processes for identifying and restoring species at risk are illustrated below. At the time of printing of this report, most sections of the SARA had come into effect.



Future Direction

Fish and Wildlife Division staff and partners have succeeded in building a progressive and responsive Species at Risk Program that includes strong stakeholder engagement. To maintain momentum and fulfil national and provincial commitments to all aspects of the program, from general status assessment to recovery planning and implementation, a stable funding platform is needed.

The 2003-2004 year will see the beginning of preparation for the publication of the 2005 general status of Alberta wild species. The general status exercise will require the re-evaluation of existing status designations and the evaluation of new taxa. Initial work will include starting the reassessment of all vertebrates, including fish, and the review of the preliminary status assessments of vascular plant species. Work will continue on the assessment of new taxonomic groups (e.g., tiger beetles, crayfish).

Another key challenge will be to address the requirements under the new federal *Species at Risk Act* (SARA). To avoid the potential for federal intrusion into areas of provincial jurisdiction, Alberta will pursue policy and related actions that will enable the province to meet or exceed SARA standards.

Communication about the provincial program to the public and other agencies and departments within and outside government remains a priority. Opportunities for stakeholder involvement should be highlighted, and participation in the identification and conservation of species at risk should be encouraged. As the number of species assessed under the provincial program continues to grow, recovery planning and implementation will continue to increase in prominence.

For more information about the Species at Risk Program, visit the web site: http://www3.gov.ab.ca/srd/fw/riskspecies/.

Fish and Wildlife Division | Administrative Regions and Location of Species at Risk Program Staff

This map reflects Species at Risk staff and FWD regional boundaries in place during 2002-2003.

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Alberta Grizzly Bear Recovery Team
Alberta Natural Heritage Information Centre
Alberta Newsprint Company
Alberta North American Waterfowl Management Plan
Alberta Ord's Kangaroo Rat Recovery Team
Alberta Peregrine Falcon Recovery Team
Alberta Piping Plover Recovery Team
Alberta Research Council
Alberta Sport, Recreation, Parks and Wildlife Foundation
Alberta Sustainable Resource Development—Land and Forest Division
Alberta Sustainable Resource Development—Public Lands Division
Alberta Sustainable Resource Development—Raven Brood Trout Station
Alberta Sustainable Resource Development—Lethbridge Resource Information Unit
Alberta Trumpeter Swan Recovery Team
Alberta Woodland Caribou Recovery Team
Alpac
Avocet Environmental
AXYS Environmental Consulting
Boreal Caribou Committee
Burlington
Cactus Communications
Calgary Zoo
Canada Western Blue Flag Maintenance/ Recovery Team
Canadian Association of Petroleum Producers
Canadian Forces Base Suffield
Canadian Museum of Nature
Canadian Wildlife Service
Canfor
Canterra
Challenge Grants in Biodiversity
City of Lethbridge
Community Lottery Board Grant Program
Conoco
Cottonwood Consultants
Devon Energy
Eastern Irrigation District
Endangered Species Recovery Fund
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Friends of Fish Creek Provincial Park
Friends of the Sam Livingston Fish Hatchery
Government of Canada Habitat Stewardship Program
Hinton Training Centre
Husky Energy
Kananaskis Field Station
Lethbridge Naturalists Society
Manitoba Museum
Manning Diversified Forest Products
National Burrowing Owl Recovery Team
Natural Sciences and Engineering Research Council
North American Bat Conservation Partnership
Paradise Canyon Resort
Parks Canada
Petro-Canada
Police Outpost Provincial Park
Provincial Museum of Alberta
Red Deer River Naturalists
Runner's Soul
Sage Grouse Recovery Action Group
Seehta
Sharp
Shell Environmental Fund
Special Areas Board
Student Career Placement Program
Suncor
TD Friends of the Environment Foundation
Tempest Energy
Tera Environmental Consultants
TransAlta Utilities
Trans-Canada Pipelines
University of Alberta
University of Calgary
University of Lethbridge
University of Michigan
Waterton Lakes National Park
Weldwood of Canada
West Central Alberta Caribou Standing Committee
West Central Oil & Gas Producers Group
Wood Buffalo National Park
Yellowstone to Yukon Conservation Initiative

Significant cooperation was also received from a number of local ranchers, landowners and leaseholders, as well as the general public and private consultants.

PROVINCIAL GOVERNMENT DEPARTMENT NAMES REFLECT GOVERNMENT ORGANIZATION IN 2002-2003.

PROVINCIAL LONG-TOED SALAMANDER MONITORING, 2002

Project Supervisor: **Lisa Wilkinson**

purpose

To continue to monitor long-toed salamanders and inventory new areas, determine population trends in Alberta, and implement conservation activities.

REGION:
Provincial (conducted in Southwest, Northwest)

TARGET SPECIES:
Long-toed Salamander
(*Ambystoma macrodactylum*)

***WILDLIFE ACT* CATEGORY:**
Non-game Animal
(*ESCC Recommendation: Special Concern*)

PROVINCIAL GENERAL STATUS:
Sensitive

Background

Long-toed salamanders are primarily found in mountain passes and their associated river valleys in western and northwestern Alberta. Long-toed salamanders are listed as *Sensitive* in Alberta because of their vulnerability to habitat change and their limited distribution. Salamander populations should be monitored for a minimum of five years to understand population trends and identify necessary conservation and management activities.

Methods

Monitoring was conducted in the Athabasca Valley (Hinton area) and Bow Valley (Kananaskis area), as part of the ongoing Researching Amphibian Numbers in Alberta (RANA) program. Pond surveys were conducted at known breeding sites, primarily to search for eggs, but also for larvae and adults. Pitfall traps were operated at one pond in each of the Athabasca Valley and Bow Valley RANA areas to capture adults and dispersing young-of-the-year. Trapping provides an opportunity to gather data on length, mass, sex, reproductive condition, occurrence of deformities and phenology, and provides a rough estimate of local relative abundance.

In 2002, inventory efforts were expanded in three regards. First, breeding ponds identified in 1995 and 1996 benchmark surveys in Jasper National Park were revisited to determine salamander population persistence. Second, surveys were expanded into new areas, including north and south of Hinton and east of Banff National Park. New sites in the Peace River area were also surveyed in an effort to determine the range of a recently discovered long-toed salamander population (minnow traps were used to capture larvae). Third, mark-recapture was initiated at a study pond in the Hinton area.

Results

In total, 149 ponds were surveyed, of which 56 had evidence of breeding salamanders. Long-toed salamander eggs were found in all but one known breeding pond in the Athabasca Valley area (surveyed 2000-2001), and in 78% of previously identified breeding ponds in Jasper National Park (surveyed 1995-1996). In the Bow Valley area, only 61% of known salamander breeding ponds (surveyed 1998-2001) continued to have evidence of breeding. Attempts to identify populations in new survey areas were unsuccessful, except in the Silver Valley Reserve, south of the Peace River, where one larval long-toed salamander was observed.

Pitfall trapping results in the Athabasca Valley indicated similar numbers of adult salamanders, and more dispersing young-of-the-year salamanders, compared to 2001. The first year of trapping at the new pond in the Bow Valley revealed a productive long-toed salamander population with a high number of young-of-the-year. Long-term monitoring of these trapping ponds will contribute to an understanding of population trends.

Recommendations/Future Direction

It appears that long-toed salamander populations may be stable in remote and protected areas, but are isolated and vulnerable to habitat destruction in other parts of their range within Alberta, particularly where human pressure on the landscape is increasing. Continued monitoring, education and conservation actions are recommended.

COOPERATING AGENCIES

Alberta Conservation Association, Hinton Training Centre, Kananaskis Field Station, Parks Canada, Student Career Placement Program, University of Calgary, Weldwood of Canada, Yellowstone to Yukon Conservation Initiative

For more information contact:

Lisa Wilkinson (*see page 7*) and see Species at Risk Report No. 73, Long-toed salamander (*Ambystoma macrodactylum*) conservation in the Alberta foothills: 2002 field summary report.

DISTRIBUTION AND HABITAT ASSOCIATIONS OF THE LONG-TOED SALAMANDER IN THE OLDMAN RIVER DRAINAGE

Project Supervisor: **Richard Quinlan**
Project Researcher: **Kim Pearson** (University of Lethbridge)

REGION:
Southwest

TARGET SPECIES:
Long-toed Salamander
(*Ambystoma macrodactylum*)

***WILDLIFE ACT* CATEGORY:**
Non-game Animal
(*ESCC Recommendation: Special Concern*)

PROVINCIAL GENERAL STATUS:
Sensitive

purpose

To increase knowledge of the distribution of long-toed salamanders in southwest Alberta, to merge data and produce a current long-toed salamander distribution map for the Oldman River drainage, and to characterize habitat/occurrence associations for long-toed salamanders in southwest Alberta, focusing on the distribution of long-toed salamanders in relation to the presence of introduced fishes.

Background

Long-toed salamanders are designated as *Sensitive* in Alberta owing to their occurrence in patchy, isolated populations, and their vulnerability to habitat destruction or alteration. Eight long-toed salamander breeding areas have been identified within Alberta, including three within the Oldman River drainage: Waterton Lakes National Park, Castle River and Crowsnest Pass. Seven independent long-toed salamander surveys occurred in those areas between 1993 and 2002.

The long-toed salamander is typically the top vertebrate predator in fishless lakes and ponds throughout its range. Numerous field studies in western North America have identified amphibian populations, including those of long-toed salamanders, that have experienced declines or extirpations as a result of the introduction of non-native trout. Several experimental investigations have also described negative effects of introduced fishes on various amphibian species. In Alberta, stocking of non-native trout in mountain lakes has been a common practice since the early 1900s. Evidence for the negative effects of introduced species on amphibians in western Canada is primarily anecdotal and, to date, the appropriate investigations have not been completed.

Methods

Thirty-nine previously unsurveyed lakes and ponds were surveyed for long-toed salamanders from May through September 2002. Presence/no detection of long-toed salamanders at each site was recorded during daytime shoreline surveys for eggs and larvae.

Occurrence data for long-toed salamander, western toad (*Bufo boreas*), Columbia spotted frog (*Rana luteiventris*), boreal chorus frog (*Pseudacris maculata*) and tiger salamander (*Ambystoma tigrinum*) were collected during all seven recorded surveys within the Oldman River drainage. These data were extracted from a series of related reports and entered into a database. Long-toed salamander distribution data were amalgamated and mapped using a Geographic Information System (ArcView).

In a University of Lethbridge study, experimental ponds were used to evaluate variation in amphibian life histories caused by predation and competition. The effects on the survival and growth rate of larval long-toed salamanders of three predators (rainbow trout fry [*Onchorhynchus mykiss*], fathead minnows [*Pimephales promelas*], and dragonfly larvae [*Aeshna* sp.]) versus predator-free environments were evaluated in a series of 1200 L plastic tanks (four replicates of each treatment) located within a fenced enclosure at the University of Lethbridge. The ponds had previously been filled with 1150 L of irrigation water, 800 g of air-dried reeds (*Typha* sp.) and 200 g of dried leaf material; the vegetation was collected from the edges of a local pond. One-litre innoculations of concentrated zooplankton collected from 3-6 local ponds commenced on 14 June and continued every 14-16 days until the end of the experiment. Zooplankton innoculations were aimed at providing an *ad libitum* food source for the salamander larvae and minimizing intraspecific cannibalism. Predator treatments were assigned to the 16 tanks at random. The predators were added to the tanks on 28 June, allowing the larval salamanders (40 individuals per pond) a seven-day acclimation period in the absence of fish and dragonfly larvae. The experiment was concluded on 28 July, at the first indication of gill resorption. The survival of all individuals was evaluated as each tank was drained, after which each individual was weighed (± 0.001 g).

Results

Long-toed salamanders were detected at 68 of the approximately 135 sites surveyed from 1993-

2002, at elevations from 1275 m to 2018 m. Thirteen previously unrecorded long-toed salamander breeding locations were documented in 2002. Selected habitat measurements were made at each of the 27 sites sampled in 2002. Regression analysis of the data is ongoing and the results will be available in autumn 2003. Trout or minnows and long-toed salamanders generally did not coexist in wetlands in the Castle and Waterton river drainages in 2001-2002. Of the 31 wetlands where long-toed salamanders were observed, 100% lacked trout and 94% lacked minnows.

In the pond experiment, on average, fewer than 10% of larval salamanders survived 30 days in the trout and minnow ponds, whereas 25-60% of the larvae in control and dragonfly ponds survived. Exposure to minnows reduced the mass of larvae by 34-50% compared to larvae from the other three environments. Survival of all predators was 100%.

Recommendations/Future Direction

Based on the unprecedented decline in amphibian populations observed globally since the 1970s, consistent, long-term monitoring of amphibian populations and environmental indicators (e.g., pH, water temperature, pollution levels) in the region is imperative for the effective management of amphibian populations. Intermittent monitoring of toxic compounds in selected water bodies throughout the headwaters of the Oldman River drainage should be undertaken to provide baseline information regarding the potential impacts of those compounds on amphibians.

Interprovincial and international collaboration with agencies responsible for long-toed salamander management in British Columbia and Montana should be continued and strengthened. Management and monitoring of widely distributed amphibians such as the long-toed salamander should be undertaken on an ecosystem scale. Long-toed salamander survey effort in the area north of Highway 517 to Kananaskis Country should be intensified.

In the interest of ecosystem integrity, and specifically amphibian management, fish and wildlife managers should seriously consider cessation of fish stocking in lakes that are likely former long-toed salamander habitats. Self-perpetuating, introduced fish populations should be removed from lakes with potential salamander habitat. Costly long-toed salamander reintroduction programs would not likely be necessary at most sites, because long-toed salamanders have been known to recolonize aquatic habitats from which they were extirpated by fish stocking.

It should be ensured that bullfrogs (*Rana catesbiana*) are not permitted to colonize Alberta. Studies in California and British Columbia showed that bullfrog population increases were correlated with declines in native frog species. Similarly, the presence of all non-native fishes such as smallmouth bass (*Micopterus dolomieui*) and goldfish (*Carassius auratus*) should be closely monitored and controlled. Both of these species have been shown to negatively affect amphibian species.

Results of the ongoing habitat association analysis may be applied by wildlife and aquatic system managers in determining habitats likely occupied by long-toed salamanders before fish stocking. This information may also help identify locations in which aquatic ecosystem restoration would benefit native amphibians.

The results of the 2002 artificial pond experiment indicate that minnows have the potential to cause a reduction in salamander growth and survival that is just as great, or greater, than that caused by better-known predators such as trout. This indicates that indirect effects, presumably involving competition for limited zooplankton prey, have the potential to play an important role in causing fish-induced reductions in salamander growth and survival. More rigorous surveys are planned for 2003 to determine the extent to which minnows may cause conservation implications for amphibians such as the long-toed salamander.

Possession and use of live bait fish has been restricted in the Bow-Crow Forest Reserve since before 1975. The challenging task of enforcing bait fish restrictions should be continued throughout Alberta. The presence of introduced bait fishes in ponds and lakes should be monitored, and they should be removed wherever possible.

COOPERATING AGENCIES

Alberta Conservation Association, University of Lethbridge, Waterton Lakes National Park

For more information contact:

Richard Quinlan (*see page 7*) and see Species at Risk Report No. 75, Distribution and habitat associations of the long-toed salamander (*Ambystoma macrodactylum*) in the Oldman River drainage.

This report is available at: http://www3.gov.ab.ca/srd/fw/riskspecies/reports.html.

NORTHERN LEOPARD FROG REINTRODUCTION PROGRAM

Project Supervisor: **Kris Kendell** (ACA)

REGION:
Provincial (conducted in Southeast, Southwest)

TARGET SPECIES:
Northern Leopard Frog (*Rana pipiens*)

***WILDLIFE ACT* CATEGORY:**
Threatened

PROVINCIAL GENERAL STATUS:
At Risk

purpose

To re-establish leopard frog populations in the headwaters of the upper Red Deer River and North Saskatchewan River drainages and to increase public awareness of conservation issues facing the northern leopard frog.

Background

The northern leopard frog was once a common and widespread amphibian found throughout central and southern Alberta. During the late 1970s, the leopard frog experienced a dramatic decline in distribution and numbers over much of its historic range in Alberta and is currently designated as *Threatened* under Alberta's *Wildlife Act*.

The leopard frog has demonstrated little ability to naturally disperse back into historical parts of its range. As a result, in 1998, the Fish and Wildlife Division began to explore the feasibility of reintroducing leopard frogs into formerly occupied habitats in the upper Red Deer River and North Saskatchewan River drainage basins. With the information gathered, the Fish and Wildlife Division and the Alberta Conservation Association initiated a pilot reintroduction project in 1999 at the Raven Brood Trout Station near Caroline, Alberta. The project involves the captive rearing of leopard frogs from egg stage of development to metamorphosed frog, in two artificial outdoor ponds at the Raven Brood Trout Station.

To date, nearly 10 000 captive-reared leopard frogs have been released into designated sites near Caroline, Rocky Mountain House and Red Deer, Alberta. Frog observations and evidence of breeding activity indicate preliminary success of the project at the release site near Caroline and at the 2001 pilot release site near Rocky Mountain House.

Methods

Four egg masses were collected from pre-determined leopard frog sites in southern Alberta and transported to the Raven Brood Trout Station. At the station, the eggs were placed in two large outdoor ponds and reared to fully metamorphosed frogs.

Water quality, water levels, potential predator threats and the development of the tadpoles within the rearing ponds were carefully monitored, managed and recorded. Shortly after metamorphosis of the frogs was complete, volunteers and project field personnel captured the young frogs by net and funnel traps from the rearing ponds.

Before being released into the wild, every tenth frog was weighed and measured. All frogs released into the wild were marked using a Visible Implant Fluorescent Elastomer tagging system. Each frog was tagged with a unique colour and foot combination that indicated the year the frog was raised and the site where it was released.

Captive-reared leopard frogs were released at three designated sites: the Hummer Property (managed by Ducks Unlimited) in the Central Parkland Natural Subregion, the upper headwaters of the Red Deer River near Caroline (Raven River), and a site located along the North Saskatchewan River near Rocky Mountain House.

northern leopard frog

Surveys were undertaken for frogs released in previous years at the Raven River and North Saskatchewan River sites. Early spring surveys focused on favourable leopard frog breeding habitat. Surveys continued through June and July at both the Raven River and North Saskatchewan River release sites. Several wetlands downstream and further abroad from the immediate release sites in both study areas were searched for leopard frogs.

Results

In total, 12 676 tadpoles hatched from the four egg masses collected in 2002. The overall productivity (percent of tadpoles that survived to metamorphosis) in the two rearing ponds in 2002 was greater than that of any previous year. Of the 12 676 tadpoles introduced into the two ponds, 4191 metamorphs were captured, marked and released, representing a survival rate of 33%.

During the 2002-2003 field season, at least three male leopard frogs were heard calling from a pond within the Raven River release site study area between 27 May and 29 May. On 19 June, one leopard frog egg mass was observed in the same pond in which the males were heard calling.

Seven additional leopard frog observations occurred between 19 June and 21 August at the Raven River release site, including the observation of a young-of-the-year leopard frog. Members of the public at the North Saskatchewan River release study area, near Rocky Mountain House, submitted two unconfirmed leopard frog observations.

Recommendations/Future Direction

Over the last decade, a wealth of information relating to the natural history, behaviour and habitat requirements of the northern leopard frog has been acquired through various studies and projects. To ensure that current populations of leopard frogs remain viable over the long-term, thus providing stock for reintroduction initiatives and perpetuity of existing populations, greater focus on the conservation and management of important habitat at leopard frog sites is critical. Such an initiative would focus on the protection and enhancement of key habitats that are required by leopard frogs for breeding, summering and overwintering. Maintaining a positive relationship between landowners and agencies involved will be instrumental for such an initiative to be a success. Equally important will be the continuing dissemination of public information on the leopard frog and the reintroduction project.

The northern leopard frog status report has been updated to reflect recent information obtained during the 2000-2001 leopard frog inventory as well as new data obtained from the scientific community. The information in the updated status report should be used by the Scientific Subcommittee of the Endangered Species Conservation Committee to re-evaluate the legislative status of the leopard frog in Alberta.

Minimum viable population size of the northern leopard frog in Alberta, at existing natural sites and release sites, requires further investigation.

COOPERATING AGENCIES

Alberta Conservation Association, Alberta North American Waterfowl Management Plan, Alberta Sustainable Resource Development—Raven Brood Trout Station, Calgary Zoo, Community Lottery Board Grant Program, Friends of Fish Creek Provincial Park, Friends of the Sam Livingston Fish Hatchery, Red Deer River Naturalists, Shell Environmental Fund, TD Friends of the Environment Foundation, local landowners, general public

For more information contact:

Kris Kendell
(Kris.Kendell@gov.ab.ca) and see Species at Risk Report No. 78, Northern leopard frog reintroduction - year 4 (2002).

The 2003 update of the northern leopard frog detailed status report is available at http://www3.gov.ab.ca/srd/fw/status/reports/rep/reports.html.

ALBERTA AMPHIBIAN MONITORING PROGRAM – RESEARCHING AMPHIBIAN NUMBERS IN ALBERTA (RANA)

Project Supervisor: **Lisa Wilkinson**

REGION:
Provincial (conducted in Southwest, Southeast, Northwest, Northeast)

TARGET SPECIES:
Canadian Toad (*Bufo hemiophrys*), Columbia Spotted Frog (*Rana luteiventris*), Great Plains Toad (*Bufo cognatus*), Long-toed Salamander (*Ambystoma macrodactylum*), Northern Leopard Frog (*Rana pipiens*), Plains Spadefoot (*Spea bombifrons*), Western Toad (*Bufo boreas*), Boreal Chorus Frog (*Pseudacris maculata*), Tiger Salamander (*Ambystoma tigrinum*), Wood Frog (*Rana sylvatica*)

***WILDLIFE ACT* CATEGORY:**
Threatened: Northern Leopard Frog

Non-game Animals: Canadian Toad, Columbia Spotted Frog, Great Plains Toad, Long-toed Salamander, Plains Spadefoot

Non-Licence Animals: Western Toad, Boreal Chorus Frog, Tiger Salamander, Wood Frog

(*ESCC Recommendation—Special Concern: Long-toed Salamander*)

(*ESCC Recommendation—Data Deficient: Canadian Toad, Great Plains Toad*)

PROVINCIAL GENERAL STATUS:
At Risk: Northern Leopard Frog

May Be At Risk: Canadian Toad, Great Plains Toad, Plains Spadefoot

Sensitive: Columbia Spotted Frog, Western Toad, Long-toed Salamander

Secure: Boreal Chorus Frog, Tiger Salamander, Wood Frog

purpose

To continue to collect detailed information on amphibian populations in Alberta, and to promote public education about amphibians and wetland conservation.

Background

Amphibians have a complicated life history—they develop from completely aquatic larvae to mainly terrestrial adults, and both forms have permeable skin. Amphibians are susceptible to small changes in their environment, acting as the proverbial canary in a coal mine, indicating the relative health of their environments. Declines in amphibian populations are occurring in some of the most pristine areas, not touched by human activity. The decline in amphibian populations and distribution has increased the need for scientific data on the distribution, and population size and trends of amphibian species.

The Researching Amphibian Numbers in Alberta (RANA) program was established in 1997 to begin long-term monitoring of amphibians and provide public education on amphibians and wetland conservation. Since its inception, the program has operated at seven sites, distributed throughout the various biomes of Alberta.

Methods

Five RANA sites were operated in 2002: Kananaskis (Bow Valley), Hinton (Athabasca Valley), Lesser Slave Lake Provincial Park, Saskatoon Island Provincial Park and Meanook Biological Research Station. In addition, several ponds were surveyed in Cypress Hills Provincial Park.

Methods involved pitfall trapping and pond surveys. Within each RANA area, pitfall traps were operated at one pond. Ponds were surrounded by silt fencing, and pitfall traps were placed every 10 metres inside and outside along both sides of the fencing. Fencing intercepts amphibians travelling to and from the pond and directs them into the traps. Traps were checked regularly, and captured amphibians were identified, aged, measured, weighed and released. Additional ponds within the RANA area were surveyed for evidence of breeding amphibians (eggs and larvae). Visiting the same ponds each year helps determine the persistence of populations. When possible, new areas were surveyed to contribute to knowledge of species distribution.

Canadian toad

Education initiatives included school talks and activities, interpretative talks and guided hikes at parks, and displays.

Results

The types of amphibian species captured and observed at RANA sites in 2002 were consistent with data from previous years. Four species were captured at pitfall traps: boreal chorus frogs, boreal toads, long-toed salamanders and wood frogs. Shoreline pond surveys were conducted at 174 ponds within four RANA study areas. The species observed, in order of decreasing abundance, were wood frogs, long-toed salamanders, boreal toads, boreal chorus frogs, Columbia spotted frogs and northern leopard frogs. Wood frogs continue to be the most ubiquitous species, being widely distributed across the province and the most abundant species captured overall during RANA trapping. Long-toed salamanders were only found at the Hinton and Kananaskis sites, where sampling effort was focused on locating and monitoring this species, which likely accounts for its relative abundance in this study. Columbia spotted frogs were encountered in small numbers because they are found only in the Rocky Mountains within Alberta, at higher elevations than other amphibians. Boreal chorus frogs tend to be absent in the Rocky Mountains and uncommon in the foothills; however, they were the most common species encountered at the Lesser Slave Lake RANA site.

Northern leopard frogs were only observed in the Cypress Hills area, which was expected given their limited range. Given the species' current status as *Threatened*, it is encouraging that evidence of breeding (i.e., tadpoles and young-of-the-year) was observed at four ponds. There were no observations of tiger salamanders, which had previously been detected at low numbers in Cypress Hills and Beaverhill Lake. It is a concern that no Canadian toads (listed as *May Be At Risk*) were observed. Only one Canadian toad has been observed throughout the history of RANA, despite the presence of several study sites within the species' range.

Recommendations/Future Direction

Few amphibian species in Alberta are considered secure, and wetland habitat is disappearing. Amphibian populations are known to fluctuate, and are strongly affected by environmental conditions. Long-term monitoring is therefore necessary to detect changes in population trends. Maintenance of at least some RANA sites, including sites in key habitats and those with long monitoring histories, is strongly recommended. Aside from amphibian monitoring, the RANA program provides extensive public education about amphibians and wetland conservation, which is arguably as important as monitoring. In 2002, educational programs reached approximately 6700 people. In recognition of global amphibian declines and national efforts to track amphibian population trends, Alberta's maintenance of the RANA program is critical.

COOPERATING AGENCIES

Alberta Community Development, Alberta Conservation Association, Hinton Training Centre, Kananaskis Field Station, Student Career Placement Program, University of Alberta, University of Calgary, Weldwood of Canada

For more information contact:

Lisa Wilkinson (*see page 7*) and see Species at Risk Report No. 74, Researching Amphibian Numbers in Alberta (RANA): 2002 provincial summary.

ALBERTA AMPHIBIAN MONITORING PROGRAM – VOLUNTEER PROGRAM

Project Supervisor: **Kris Kendell** (ACA)

REGION:
Provincial

TARGET SPECIES:
Canadian Toad (*Bufo hemiophrys*), Columbia Spotted Frog (*Rana luteiventris*), Great Plains Toad (*Bufo cognatus*), Long-toed Salamander (*Ambystoma macrodactylum*), Northern Leopard Frog (*Rana pipiens*), Plains Spadefoot (*Spea bombifrons*), Western Toad (*Bufo boreas*), Boreal Chorus Frog (*Pseudacris maculata*), Tiger Salamander (*Ambystoma tigrinum*), Wood Frog (*Rana sylvatica*)

***WILDLIFE ACT* CATEGORY:**
Threatened: Northern Leopard Frog

Non-game Animals: Canadian Toad, Columbia Spotted Frog, Great Plains Toad, Long-toed Salamander, Plains Spadefoot

Non-licence Animals: Western Toad, Boreal Chorus Frog, Tiger Salamander, Wood Frog

(*ESCC Recommendation—Special Concern: Long-toed Salamander*)

(*ESCC Recommendation—Data Deficient: Canadian Toad, Great Plains Toad*)

PROVINCIAL GENERAL STATUS:
At Risk: Northern Leopard Frog

May Be At Risk: Canadian Toad, Great Plains Toad, Plains Spadefoot

Sensitive: Columbia Spotted Frog, Long-toed Salamander, Western Toad

Secure: Boreal Chorus Frog, Tiger Salamander, Wood Frog

COOPERATING AGENCIES

Alberta Conservation Association, Alberta Sport, Recreation, Parks and Wildlife Foundation

For more information contact:

Kris Kendell
(Kris.Kendell@gov.ab.ca).

purpose

To better understand Alberta's amphibians with respect to long-term population trends, natural fluctuations and distributions, and to provide information to the public about the importance of this group of animals in the environment.

Background

The volunteer component of the Alberta Amphibian Monitoring Program (AAMP) is delivered by the Alberta Conservation Association. The program was initiated in 1992, coordinated by a small group of dedicated volunteers in southern Alberta. The Fish and Wildlife Division, in concert with the Alberta Conservation Association, developed AAMP into a province-wide program to increase the public's awareness of amphibians and collect important information on the presence of all 10 species of amphibians found in Alberta.

Methods

The volunteer monitoring program is advertised in newsletters, natural history journals and newspapers as well as on the radio. In addition, displays and talks are presented at parks, schools and natural history group meetings.

An identification manual and audiocassette tape featuring the calls of amphibians in the province are provided to interested volunteers. The monitoring manual contains information on the identification and ecology of Alberta's amphibians and includes monitoring pointers, range maps and colour photographs for each species. The audiocassette tape features the calls of all frog and toad species found in the province. Included with the manual is a simple data sheet to allow volunteers to describe and submit their findings each year.

Volunteers of the program are asked to listen for calling frogs and toads in the spring and search for egg masses, tadpoles and adults during the summer. The volunteers then submit this basic presence information to the program coordinator.

The *Croaks and Trills* newsletter is sent out to volunteers twice a year. It highlights the results of the program and provides interesting articles on various projects in the province and elsewhere, and on conservation issues and ecology relating to herpetiles. Volunteers are also sent a reminder with the newsletter to begin surveying each spring and to submit their data in the fall.

Results

In total, 46 individuals and families contributed 333 amphibian observations in the 2002-2003 program year. Of Alberta's 10 species of amphibians, eight species were observed: boreal chorus frog (n=109), wood frog (n=133), Columbia spotted frog (n=28), northern leopard frog (n=2), boreal toad (n=29), Canadian toad (n=6), long-toed salamander (n=17) and tiger salamander (n=9). In addition, two species of garter snake were observed: the common garter snake (*Thamnophis sirtalis*) (n=4) and the western terrestrial garter snake (*Thamnophis elegans*) (n=3). Also documented on volunteer data sheets in 2002 were two avian species: sora (*Porzana carolina*) (n=10) and osprey (*Pandion haliaetus*) (n=1). Volunteers collected no data on the plains spadefoot and Great Plains toad.

All of the data collected by volunteers in 2002-2003 were entered into the Biodiversity/Species Observation Database.

Recommendations/Future Direction

A critical review of the current amphibian sampling protocol that is provided with the existing AAMP monitoring manual should be undertaken. The current protocol may benefit from greater detail and attention to the following: guidance in pond selection and survey techniques, field safety considerations, planning ahead for fieldwork, recommended survey conditions (time of day and year, weather and habitat), and concern with respect to handling amphibians.

BURROWING OWL SURVEY AND MONITORING, BROOKS AREA

Project Supervisor: **Reg Russell**

purpose To determine the population status of the burrowing owl in the Brooks (Kininvie) area.

REGION:
Provincial (conducted in Southeast)

TARGET SPECIES:
Burrowing Owl (*Athene cunicularia*)

***WILDLIFE ACT* CATEGORY:**
Threatened

PROVINCIAL GENERAL STATUS:
At Risk

Background

The burrowing owl occurs in Alberta during the summer months, breeding throughout the Mixedgrass and Dry Mixedgrass natural subregions in the southeastern part of the province. The species inhabits treeless plains with sparse vegetation, and requires abandoned ground squirrel or badger excavations for nests and shelter.

Population surveys suggest that the Alberta population has declined by approximately 30% over a 10-year period. The breeding population in Alberta is currently estimated to be fewer than 800 pairs, compared with estimates of over 1500 pairs in 1978, and approximately 1000 pairs in 1990.

Although the exact causes of the population decline are unknown, possible causes include climate change, degradation and fragmentation of nesting habitat, use of pesticides, decreased availability of burrows because of reductions in burrowing mammal populations, and increased predator populations. Suitable grassland habitat was converted rapidly for cultivation more than a decade ago, from 1976-1986, but burrowing owls have continued to decline since then. In addition, the species is an obligate neotropical migrant, and may be affected by mortality factors or habitat alteration on its migration and winter ranges.

Methods

Known nesting sites in the Brooks area and Eastern Irrigation District (K-blocks) were revisited and monitored. Surveys were repeated in the K-blocks (160 quarter sections) using a standardized protocol for burrowing owl call/response.

All observations, including Global Positioning System locations and associated relevant information, were entered into the Biodiversity/ Species Observation Database.

Results

A summary of key findings follows.

K-blocks:

- All 160 quarter sections were searched.
- Six nests were found within the blocks during the regular survey.
- An average of 2.8 young per nest was found at successful nests.
- The K-block population is continuing to decline (from 13.5 nests per 100 km^2 in 1997 to 4.8 per 100 km^2 in 2002). Moreover, productivity was quite low at the few nests that were successful in 2002. These trends give rise to further concern.

Recommendations/Future Direction

The surveys should be repeated in the Brooks (Kininvie) area in 2004. The trend blocks in the Hanna area will be the priority for 2003. The trend blocks in the Hanna area have not been completely surveyed since 1998. The blocks in the Hanna and Brooks areas will be surveyed in alternate years, from now on.

burrowing owl

COOPERATING AGENCIES

Alberta Burrowing Owl Recovery Team, Eastern Irrigation District, National Burrowing Owl Recovery Team

For more information contact:

Arlen Todd (*see page 7*) or **Reg Russell** (Reg.Russell@gov.ab.ca) and see Species at Risk Report No. 58, 2002 burrowing owl trend block survey and monitoring, Brooks area.

This report is available at: http://www3.gov.ab.ca/srd/fw/riskspecies/reports.html.

FERRUGINOUS HAWK POPULATION ESTIMATES AND SURVEY PROTOCOL

Project Supervisor: **Richard Quinlan**
Project Biologist: **Brad Taylor** (ACA)

REGION:
Provincial (conducted in Southeast)

TARGET SPECIES:
Ferruginous Hawk (*Buteo regalis*)

***WILDLIFE ACT* CATEGORY:**
Threatened

PROVINCIAL GENERAL STATUS:
At Risk

COOPERATING AGENCIES
Alberta Conservation Association

For more information contact:

Richard Quinlan (*see page 7*) and see Species at Risk Report No. 70, Population estimates and a survey protocol for ferruginous hawks in Alberta.

This report is available at: http://www3.gov.ab.ca/srd/fw/riskspecies/reports.html.

purpose

To re-evaluate the ferruginous hawk population estimate and to develop a standardized protocol for monitoring population trends of ferruginous hawk in Alberta.

Background

Ferruginous hawk surveys in Alberta were initiated in 1982 and repeated in 1987, 1992 and 2000. Unstratified quadrats four miles by four miles (6.4 km x 6.4 km) in size were randomly selected across the known ferruginous hawk range in Alberta. All ferruginous hawks and active nests were counted and an estimate of breeding pairs was extrapolated from the number of active nests. Estimated ferruginous hawk populations increased from 1982 to 1987, were similar between 1987 and 1992, and decreased from 1992 to 2000 (Table 1).

Table 1. Historical ferruginous hawk population estimates

Year	Population Estimate (Breeding Pairs)	Confidence Interval (%)
1982	1059	40.5%
1987	1770	28.5%
1992	1702	30.6%
2000	731	50.1%

By stratifying the sample units using the Native Prairie Vegetation Baseline Inventory data, it was anticipated that the precision of ferruginous hawk population estimates could be increased.

Methods

The analysis was applied to the entire Grassland Natural Region (Figure 1). The quadrats were stratified into categories according to native prairie class. Native prairie class is the total percent of all grassland components as determined by the Native Prairie Vegetation Baseline Inventory. This process resulted in each quadrat being placed in one of four strata. Five combinations of the four strata were analysed using ferruginous hawk data from 1992 and 2000 to determine the stratification that offered the most precision. Population estimates (number of breeding pairs) for each stratum were based on the number of nests observed per quadrat, extrapolated for the stratum. These estimates were then combined to give an overall population estimate.

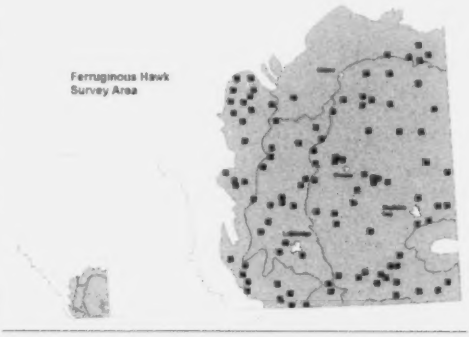


Figure 1. Grassland Natural Region with ferruginous hawk quadrats from 2000.

Results

The smallest confidence limits for estimation of population size were achieved by using just two strata: greater than 50% and less than 50% native prairie.

A review of survey and monitoring protocols was completed. The standard inventory protocol will only be altered slightly, with new quadrats being added in the greater than 50% native prairie category to further improve precision. An annual trend monitoring program was designed.

Recommendations/Future Direction

The Alberta ferruginous hawk population will be monitored for another 20 years using both full and partial surveys. Full surveys will be carried out every five years to determine a provincial population estimate, whereas trends will be monitored through annual surveys of 30 quadrats distributed throughout the Grassland Natural Region. Given the reliance of the ferruginous hawk on Richardson's ground squirrel, a ground squirrel monitoring protocol has also been developed and will be initiated in Alberta (*see page 33*).

THE SAGE-GROUSE HABITAT STEWARDSHIP INITIATIVE

Project Supervisors: **Joel Nicholson, Paul Jones** (ACA), **Dale Eslinger**

REGION:
Southeast

TARGET SPECIES:
Greater Sage-grouse (*Centrocercus urophasianus*) and other prairie wildlife

***WILDLIFE ACT* CATEGORY:**
Endangered

PROVINCIAL GENERAL STATUS:
At Risk

purpose To conserve and enhance the native prairie ecosystem of southeastern Alberta in order to conserve the habitat of sage-grouse and other prairie wildlife species.

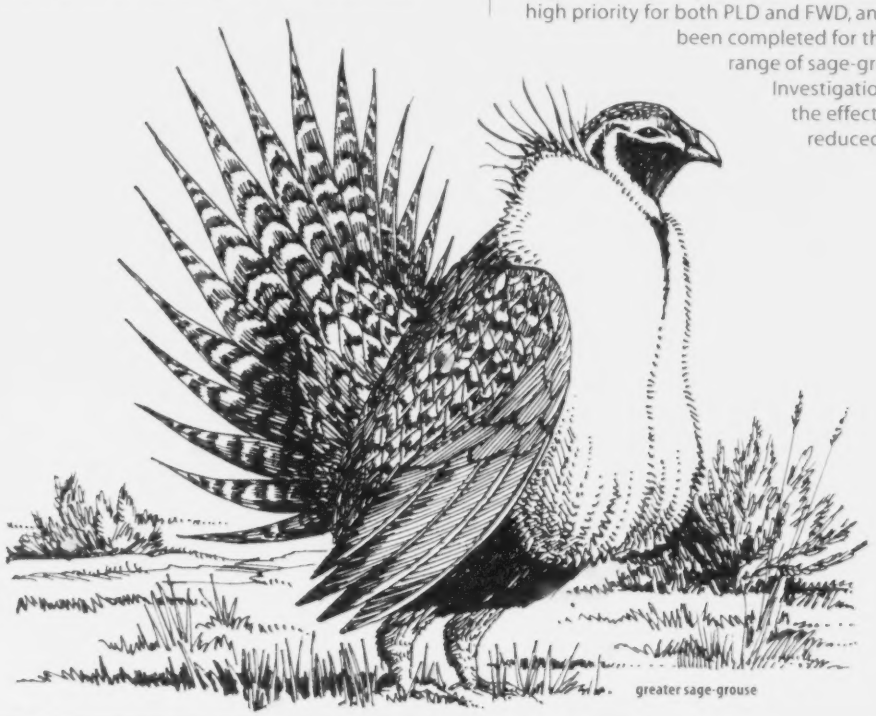
Background

The native prairie ecosystem is the most threatened ecosystem in Alberta. Under the cumulative effects of urbanization, cultivation, livestock grazing, roads, and oil and gas development, the face of the native prairie has been altered dramatically. Prairie wildlife species have faired as poorly as the prairies themselves. Changes in agricultural practices have resulted in a decline in grassland bird populations, with those remaining being concentrated on native prairie. The native prairies of southeastern Alberta are of significant international importance, acting as breeding grounds and nesting habitat for both resident and migratory birds.

The Alberta Conservation Association (ACA) Sage Grouse Habitat Stewardship Initiative uses land stewardship, by ranchers and farmers, as a tool to protect and enhance native prairie habitat. Its goals are to educate ranchers on the principles of sustainable rangeland management and, through the development of a multi-use plan, assist them in making informed decisions regarding grazing practices that will benefit the cattle operation, native prairie habitat and wildlife. The program emphasizes an ecosystem approach, and the importance of residual cover that will provide benefits for many wildlife species. Where appropriate, special considerations are given to individual species. A partnership between the Fish and Wildlife Division (FWD), Public Lands Division (PLD) and the ACA has been developed to use the land stewardship approach described above to target sage-grouse habitat in the southeastern corner of Alberta.

Sage-grouse are at the northern limit of their range in Alberta. Sagebrush, in particular silver sage, provides most of the diet of adult birds. The species' range is currently limited to the southeastern corner of the province, within the sagebrush range of the mixed grass prairie. The Alberta greater sage-grouse population has declined by 66-92% over the last 30 years. Previous research in Alberta suggests that the population has declined as a result of poor recruitment. Low levels of recruitment appear to be linked to poor chick survival as a result of poor quality brood-rearing habitat.

Although grazing management has been the principal focus of recovery efforts, local initiatives are now also focusing on cumulative effects and their potential impact on sage-grouse habitat. Mapping of important sagebrush landscapes has been identified as a high priority for both PLD and FWD, and has been completed for the entire range of sage-grouse. Investigations into the effects of reduced surface



greater sage-grouse

water flow on sagebrush communities has also been completed, and this information will be used in further habitat analysis and management. Further work is underway to look at the impacts of oil and gas development in sage-grouse range, and to identify key habitats as conservation targets.

In order to assess work undertaken by the sage-grouse initiative, a partnership with the University of Alberta has been developed. This will provide additional research resources over and above current staff time spent on project assessments and evaluation. Researchers will evaluate any grazing system changes and range improvements that are made to enhance sage-grouse habitat. Evaluation of changes to ranch grazing systems and the subsequent effect on prairie wildlife will be a key part of a successful and evolving program. Long-term evaluation of the project will focus on sage-grouse response to changes in the habitat as a result of changes to grazing practices and range improvements. Severe drought conditions from 1999-2001 have postponed much of the grazing related work, because accurate evaluation of the landscape was not possible. With recent recovery of grasslands underway following significant rainfalls in 2002, it is hoped that projects will now be able to proceed.

Additional work is underway to form a local recovery action group for sage-grouse. This group will consist of local stakeholders and agencies, and will drive all future sage-grouse recovery actions. Successful formation and operation of this committee will be key to the success of sage-grouse recovery and the sage-grouse habitat stewardship initiative.

Methods

Sagebrush mapping was completed using a specialized air photo interpretation technique. An analysis of water developments in sage-grouse range has been completed using air photos and licence databases. Analysis of the effect of water management on sagebrush communities has been completed, using this information. The PLD has undertaken an analysis of grazing history in southeast Alberta, and has initiated investigations into silver sagebrush ecology. Additionally, PLD staff members have been engaging ranchers regarding sage-grouse and grazing management. Additional literature review and compilation work is contributing to the development of best management practices for sage-grouse management in the silver sagebrush ecosystem.

Results

Sagebrush density and distribution mapping has been completed for the entire range of sage-grouse in Alberta. An analysis of water management and its effects on the sagebrush community has been completed, and a technical report with management recommendations has been produced. A database of all water management activities within sage-grouse range is now available. Significant information has been compiled on grazing history in southeast Alberta and how it relates to sage-grouse. This information will be used to aid land and resource managers in developing management strategies for sage-grouse in cooperation with local landowners and grazing leaseholders. Best management practices will enable wildlife managers and land managers to provide appropriate advice on landscape management.

Recommendations/Future Direction

- Continue investigations into cumulative effects on the landscape and their effect on silver sagebrush and prairie wildlife.
- Implement cooperative management strategies with PLD, ACA, local ranchers and the sage-grouse recovery action group.
- Evaluate management activities over the long term.

COOPERATING AGENCIES

Alberta Conservation Association, Alberta Sustainable Resource Development—Public Lands Division, Government of Canada Habitat Stewardship Program, University of Alberta, local ranchers

For more information contact:

Dale Eslinger (Dale.Eslinger@gov.ab.ca) or **Joel Nicholson** (*see page 7*).

DEVELOPING A HABITAT-BASED POPULATION VIABILITY MODEL FOR SAGE-GROUSE IN SOUTHEASTERN ALBERTA, 2002

Project Supervisors: **Joel Nicholson, Dale Eslinger**
Project Researcher: **Cameron Aldridge** (University of Alberta)

REGION:
Southeast

TARGET SPECIES:
Greater Sage-grouse
(*Centrocercus urophasianus*)

***WILDLIFE ACT* CATEGORY:**
Endangered

PROVINCIAL GENERAL STATUS:
At Risk

purpose

To relate habitat characteristics to measures of sage-grouse productivity and survival, and ultimately to develop rigorous habitat models to assess the viability of the sage-grouse population in Alberta.

Background

Sage-grouse historically occurred in British Columbia, Alberta, Saskatchewan and 16 U.S. states, but they have been extirpated from British Columbia and five states. Throughout their range, sage-grouse have declined by an estimated 45-80% since the 1950s. The decline has been most severe at the northern fringe of the species' range, with the Alberta population experiencing a 66-92% decline over the last 30 years. The reasons for this decline are uncertain, but previous research in Alberta suggests that poor quality habitat has reduced survival, particularly that of chicks. From this research, the population decline appears to be a result of high juvenile mortality leading to poor juvenile recruitment. Chick survival may be limited by available escape cover, as there is limited grass cover and sagebrush (*Artemisia cana*) cover in southern Alberta. However, the lack of mesic sites, and thus, lush forbs that are important in the diet of chicks, may also have reduced chick survival. Grass height is positively correlated with nest success for both artificial and natural sage-grouse nests, suggesting that habitat management could benefit both sage-grouse productivity and chick survival.

Methods

Counts were conducted from 30 March to 6 June 2002 at all previously known sage-grouse leks to obtain population estimates. Birds were trapped and females received necklace-style radio transmitters. Once released, sage-grouse were tracked with a scanning telemetry receiver and located using triangulation techniques every other day during the nesting period in order to determine nest fate. Various measures of reproductive success were also estimated. After nesting efforts ceased, nest site characteristics were measured. Canopy cover and mean maximum height of vegetation classes were calculated at the nest site as well as at random locations. At all brood and paired random locations, nine insect pitfall traps (400 mL plastic cups) with 250 mL of a mild soap solution were used to sample insect diversity. One trap was placed at the use site, and traps were also placed 5 m and 10 m away in each of the four ordinal directions.

Radio-collared birds were followed throughout the spring and summer to determine habitat use. Each week, females with or without broods were tracked and the same habitat measurements described for nest sites were recorded. Brooding females were not intentionally flushed until chicks were at least three weeks of age, and then brood flush counts were performed weekly to estimate chick survival. The goal was to capture all chicks in each brood at less than one week of age, and to fit two chicks from each brood with a micro-transmitter. Radio signals from the chicks' transmitters were triangulated every second day to estimate chick survival. Radio-tagged chicks were to be recaptured at 12 weeks of age, and their transmitters replaced with a full size necklace-style adult transmitter.

Results

Lek counts resulted in the identification of seven remaining active sage-grouse leks. Maximum daily counts at each of the seven leks resulted in a maximum total count of 97 males and a 2002 Alberta spring sage-grouse population estimate of 291 to 431 individuals. This is approximately a 25% decline from numbers estimated in 2001, when 125 males were counted at seven leks and the 2001 spring population was estimated at 375 to 555 individuals.

In total, 21 female sage-grouse were captured in 2002 (19 adults and 2 yearlings); two captured adults were birds collared in previous years. Twenty-two males were also captured (16 adults and 6 yearlings). Approximately 19% of the birds captured were yearlings, which is lower than the long-term average of about 24%, but similar to last year's average of 17%. This proportion is related to poor productivity last year (2001), and thus represents lower than normal recruitment.

Nest success was the lowest ever recorded in Alberta (13.5%; 5 of 37 nests). This low success

was a direct result of rare weather events: a large mid-May snowstorm and three days of continuous cold rain in early June resulted in the abandonment of at least six nests. Clutch size estimates for all nests (7.1 ± 0.43, n=34) and successful nests (8.8 ± 0.20, n=5) were similar to estimates from previous years. Egg viability (86%) was lower than in previous years, with 6 of 44 eggs laid in five successful nests failing to hatch. However, including abandoned nests, only 42.2% (38 of 90) of the eggs were viable. Of the five successful nests, only three females had broods survive more than three days post-hatch. As a result, only 12 chicks were captured from each of the three surviving broods, but two chicks from each brood were affixed with micro-transmitters. Three of the six collared chicks were killed by predators between 10 and 29 days after capture. Flush counts from the two broods that were regularly tracked indicated that only 5.8% (1 of 17) of the chicks survived past 50 days of age.

To investigate habitat selection, vegetation data were gathered at 140 sage-grouse use sites and 140 random locations. These included 37 nest sites, 14 brood-rearing locations from 3 different broods, and 89 broodless female locations. All habitat and insect data are being analysed and will be incorporated into future resource selection models.

Recommendations/Future Direction

The final year of data collection for this research project will take place in 2003-2004. Data are currently being compiled and models are being generated to understand habitat requirements for sage-grouse in Alberta. Once these models are developed, they will provide useful insights into sage-grouse habitat requirements, and allow for sound management decisions to be made. These models will help to direct management aimed at maintaining or improving sage-grouse habitat and enhancing productivity and survival, and thus, the long-term viability of sage-grouse in Alberta.

COOPERATING AGENCIES

Alberta Conservation Association, Alberta North American Waterfowl Management Plan, Cactus Communications, Challenge Grants in Biodiversity, Endangered Species Recovery Fund, Natural Sciences and Engineering Research Council, University of Alberta

For more information contact:

Joel Nicholson *(see page 7)* or **Dale Eslinger** (Dale.Eslinger@gov.ab.ca).

WINTER HABITAT SELECTION AND SURVIVAL BY SAGE-GROUSE IN SOUTHEASTERN ALBERTA, 2002

Project Supervisors: **Joel Nicholson, Paul Jones** (ACA)
Project Researcher: **Cameron Aldridge** (University of Alberta)

REGION:
Southeast

TARGET SPECIES:
Greater Sage-grouse
(*Centrocercus urophasianus*)

***WILDLIFE ACT* CATEGORY:**
Endangered

PROVINCIAL GENERAL STATUS:
At Risk

purpose To gain an understanding of the winter ecology of sage-grouse in southeastern Alberta, focusing on habitat use and survival.

Background

Sage-grouse historically occurred in British Columbia, Alberta, Saskatchewan and 16 U.S. states, but they have been extirpated from British Columbia and five states. Declines throughout the range are estimated at 45-80% since the 1950s. Canadian populations have experienced the most severe declines, with declines in Alberta over the last 30 years estimated at 66-92%. Previous research in Alberta suggests that poor quality habitat has reduced survival, particularly that of chicks, yet very few studies have been conducted to assess the importance of winter habitat. Sage-grouse are dependent on sagebrush for food and shelter during the winter, and small changes to the quality or availability of winter habitat have been shown to cause drastic reductions in some sage-grouse population numbers. There have been no studies performed in southern Alberta to identify important sage-grouse winter habitat and determine whether winter habitat may be a limiting factor.

Methods

Sage-grouse were captured throughout the spring and summer and females were fitted with radio transmitters as part of a separate summer habitat selection research program (*see page 21*). These same radio-collared females were followed for the winter ecology research project. Females were tracked from September through to the following breeding season (late March), allowing for survival estimates to be generated and winter habitat use to be assessed. Each week, females were flushed and use sites were georeferenced to track movements and facilitate landscape-scale habitat analyses using a Geographic Information System. Microsite habitat measurements were performed at each use site as well as at paired random locations. These measurements included assessment of the dominant vegetation type and measurements of sagebrush, snow depth, slope, aspect, temperature and wind speed.

Results

This summary includes data gathered and compiled for the first year (September 2002 through March 2003) of this two-year research project. Eighteen different adult females were tracked over the winter for a total of 310 locations. Only three of these 18 females were killed between 1 September and 31 March (all three died prior to 22 October). Kill sites were located for all three females. Based on feather remains and the presence of predator feces at the kill sites, two of these females were likely killed by avian predators (raptors) and one was killed by a canid predator. Two of the remaining 15 females were tracked into midwinter, when the batteries on their collars likely died and they could no longer be located. Thus, female survival from fall to spring was estimated to be fairly high, at about 83% (15 of 18 females), with all three fatalities occurring in the early fall.

Microsite habitat assessments were performed at all female winter use sites and paired random locations. Of the 310 female sage-grouse locations, measurements were completed at 220 sage-grouse use sites and at 220 paired random locations for 18 different females from 22 September until 11 March (when females began initiating breeding activities).

Recommendations/Future Direction

This was the first year of a two-year research project, and information on adult female survival and habitat use will be collected over the next winter (2003-2004). Given the excellent vegetation growth in the summer of 2002 and moisture levels in the early spring of 2003, it is likely that productivity will be higher, allowing for juvenile (young-of-the-year) sage-grouse to be followed through the 2003-2004 winter along with adult females. Once the second year of fieldwork is completed, resource selection function models and habitat probability maps will be developed that will identify suitable sage-grouse winter habitat, allowing for identification and management of critical sage-grouse winter habitat in Alberta. Winter survival estimates will also be used to update current demographic models. These products will be extremely vital to understanding sage-grouse habitat requirements and in developing sagacious adaptive management strategies.

COOPERATING AGENCIES

Alberta Conservation Association, Endangered Species Recovery Fund, University of Alberta

For more information contact:

Joel Nicholson (*see page 7*) or
Paul Jones (Paul.Jones@gov.ab.ca).

THE USE OF CALL PLAYBACKS TO CENSUS LOGGERHEAD SHRIKES IN SOUTHERN ALBERTA

Project Supervisor: **David Prescott**

REGION:
Provincial (conducted in Southeast)

TARGET SPECIES:
Loggerhead shrike (*Lanius ludovicianus*)

***WILDLIFE ACT* CATEGORY:**
Endangered

(*ESCC Recommendation: Special Concern*)

PROVINCIAL GENERAL STATUS:
Sensitive

purpose

To investigate the use of call playbacks to improve detection frequency of loggerhead shrikes during surveys in Alberta.

Background

Populations of loggerhead shrike have declined markedly in many areas of North America in recent years. Populations in eastern Canada are designated as *Endangered* by the Committee on the Status of Endangered Wildlife in Canada, whereas populations in western Canada are considered *Threatened* (COSEWIC 2003). In Alberta, the species no longer occupies the northern parts of its historical range, and is recommended by the Endangered Species Conservation Committee to be a *Species of Special Concern*.

Effective management of species at risk such as the loggerhead shrike requires accurate information on population size and distribution. In Alberta, a variety of survey techniques (other than the Breeding Bird Survey) have been used to gather this information. These include roadside surveys conducted from moving vehicles, ground searches of roadside habitats, and intensive block surveys. In general, roadside surveys are most applicable to inventories over a wide geographical area, and may be particularly applicable to shrikes, which are often found in association with roads. However, these surveys rely on shrikes being readily visible to the observer, and only a fraction of individuals (estimated to be 32.9%) will be encountered on each route. This study examines the use of call playbacks to improve detection frequency of loggerhead shrikes during roadside (and other) surveys. This technique does not appear to have been used to inventory shrikes, but it has been widely used for a variety of other avian species. Two approaches were used to determine the utility of playbacks for this species: (1) broadcast recorded calls at sites known to be occupied by shrikes and determine response rates and characteristics; and (2) compare the results of a pilot roadside survey using call playbacks with a standard driving survey on the same routes.

Methods

Playbacks at known shrike locations

Shrikes often return to previously used nesting areas. To identify sites potentially occupied in 2002, recent (2000-2001) records in the Biodiversity/Species Observation Database were reviewed, and unpublished records were requested from biologists and naturalists throughout the provincial range of the species. Observers then visited many of these sites in late May and early June to determine occupancy by shrikes in 2002. Occupied sites were revisited within seven days by a second observer to test responses to playback. This observer first simulated a roadside driving survey by scanning the area within 500 m on either side of the provided Global Positioning System coordinates while driving 50-70 km/hr. The observer then returned to the provided coordinates and scanned the area for 120 s. A 20-s playback of the "squawk" call was then delivered from a portable tape player, followed by a 60-s waiting period, an additional 20-s playback, and a final 60-s observation period. The observer recorded data on the timing and nature of responses by shrikes during the playback sequence, as well as information on habitat structure and stage of the nesting cycle. If no bird was detected at a site, the observer searched the habitat on foot to determine if the site was still occupied. Sites where no birds were found after these efforts were deleted from further consideration.

Pilot roadside inventory

A pilot roadside inventory using stops and playbacks was compared with a "standard" roadside inventory (driving only) along two parallel routes (total of 163 km) at the northern edge of the Dry Mixedgrass Natural Subregion. The number and location of shrikes along these routes were not known to the observers. The playback component involved an observer stopping for 90 s (including 20 s of playback) at 500-m intervals along the established routes. A second observer conducted a "standard" driving survey along the same routes within two days of the playback survey. The results (number of occupied sites, duration of survey) of the two methods were compared.

Results

Playbacks at known shrike locations

In total, 182 shrike locations were found during the study, in an area extending from Stettler and Provost to the Montana border. A total of 130 of these sites was included in the playback study, which was conducted between 18 June

and 6 July. Over 35% of these sites were found simply by driving past the site, with 57.1% of sites being confirmed to be occupied by the end of the pre-playback period. Playbacks elicited a substantial increase in the number of birds detected, with 73.2% of sites being confirmed to be occupied by the end of the first 20-s playback, and 83.9% by the end of the second playback. Strength of response decreased with increasing distance, with a notable decrease in response at distances > 150 m. "Strong" responses were reported at 19.1% of sites, "medium" at 26.4%, "mild" at 30.0%, and "none" at 24.5%. There appeared to be no association between the strength of response and stage of nesting, cover type, or time of day.

Pilot roadside inventory

The roadside inventory using playbacks was conducted between 28 and 30 June. Twenty-three birds were found at 21 sites during 669 minutes of survey effort. The "standard" driving survey was conducted on 1 July 2002. Seven birds were detected at seven sites during 165 minutes of survey. Overall, the playback survey detected 229% more shrikes and 200% more occupied sites than the standard driving survey. However, the playback survey took 305% longer to complete, and resulted in fewer birds (0.034) and occupied sites (0.031) per minute of survey effort than did the standard driving survey (0.042 for both measures).

Recommendations/Future Direction

Loggerhead shrikes showed variable responses to call playback, but birds were, in general, more likely to be detected when playback was used. The most telling account of the improvement offered by call playbacks is the 200% increase in the number of occupied sites found along routes when compared to a standard driving survey. However, routes using playback take substantially longer to complete, and consequently result in fewer detections per hour of survey effort. Further refinements to the technique will therefore be investigated to increase the efficiency of playback surveys. Suggested improvements include reducing the amount of time spent at each stop, or delivering playback from moving vehicles. Such improvements will be investigated in conjunction with the prairie-wide survey for loggerhead shrikes to be conducted in 2003.

loggerhead shrike

COOPERATING AGENCIES

Canadian Wildlife Service

For more information contact:

Dave Prescott (*see page 7*) and see Species at Risk Report No. 67, The use of call playbacks for censusing loggerhead shrikes in southern Alberta.

This report is available at: http://www3.gov.ab.ca/srd/fw/riskspecies/reports.html.

MONITORING AND PRODUCTIVITY SURVEYS FOR THE PEREGRINE FALCON IN THE NORTHEAST REGION, 2002

Project Supervisors: **Matt Besko, Rob Corrigan** (ACA)

REGION:
Provincial (conducted in Northeast)

TARGET SPECIES:
Peregrine Falcon (*Falco peregrinus*)

***WILDLIFE ACT* CATEGORY:**
Threatened

PROVINCIAL GENERAL STATUS:
At Risk

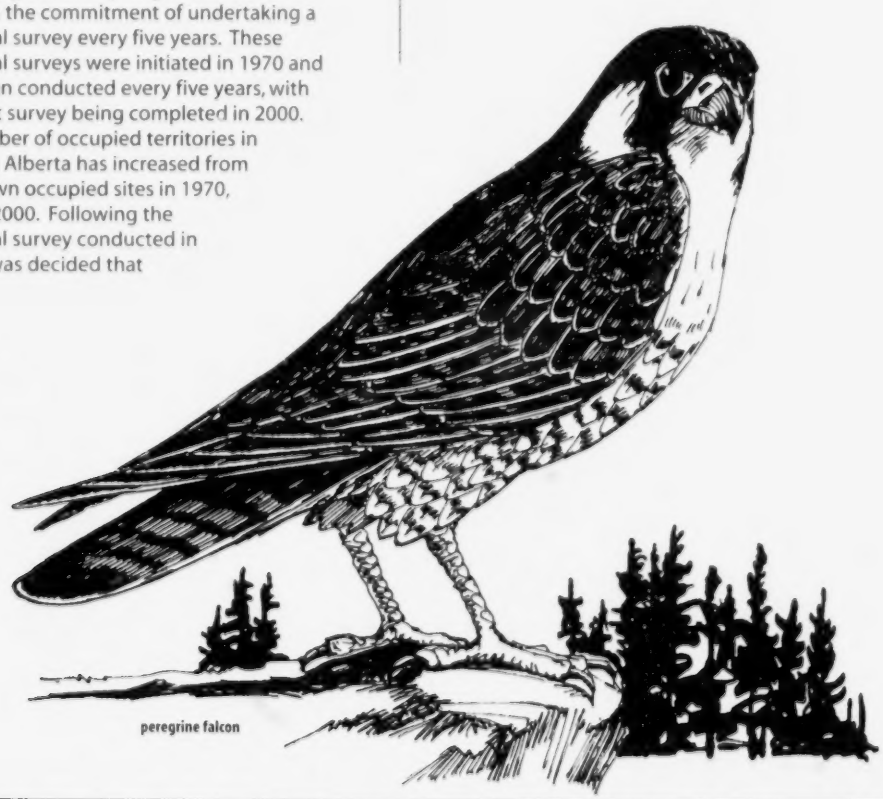
purpose

To monitor the site occupancy and productivity of nesting peregrine falcons in the Fort Chipewyan study area of northeast Alberta.

Background

Annual monitoring and management of peregrine falcons in northern Alberta has been ongoing since 1971. This annual monitoring was in response to a population decline that occurred globally as a result of the widespread use of organochlorine pesticides, most notably DDT. By 1974, there were only three known occupied territories of peregrine falcons in northern Alberta, all in the Fort Chipewyan area. The Canadian Wildlife Service initiated a captive breeding program and by 1975, captive-bred peregrines were available for release. Captive-bred peregrines were used to supplement remnant existing populations in northern Alberta. Since the mid-1970s, the population of peregrine falcons has been actively managed to increase productivity and monitored to observe population trends.

A component of the continuing monitoring and management of peregrines in Alberta has been the commitment of undertaking a provincial survey every five years. These provincial surveys were initiated in 1970 and have been conducted every five years, with the latest survey being completed in 2000. The number of occupied territories in northern Alberta has increased from two known occupied sites in 1970, to 25 in 2000. Following the provincial survey conducted in 2000, it was decided that ongoing monitoring of the entire northern peregrine population would no longer occur. The number of occupied sites had stabilized, and natural productivity was occurring at a sustainable level. For logistical reasons, the northern population was divided into four study areas: Fort Chipewyan, Peace Point, Fort Smith and the Canadian Shield. Of these study areas, three areas would continue to be monitored annually for occupancy and productivity. Because of the expense and difficulty in accessing the Canadian Shield sites, this study area was not considered for annual monitoring. It was decided that Wood Buffalo National Park (WBNP) would be responsible for Fort Smith and Peace Point monitoring and WBNP and the Fish and Wildlife Division (FWD) would cooperatively monitor the Fort Chipewyan study area.



peregrine falcon

Methods

Within the Fort Chipewyan study area, all suitable nesting locations have been identified through historical nesting records. These sites were surveyed three times to determine the occupancy of a cliff. Once a cliff was determined to be occupied, it was monitored for productivity throughout the breeding cycle to determine egg laying, hatching and fledging success. Young that were observed at 25 days of age were considered to have fledged. Although fledging does not occur until 35-40 days, it is often difficult to determine fledging success if the young have flown prior to the site visit. During the final site visit, young falcons were banded with a United States Fish and Wildlife aluminum band (right leg) and a coloured alpha-numeric band (left leg). All information obtained was entered into the Biodiversity/Species Observation Database.

Results

In 2002, there were eight sites occupied by territorial pairs out of 11 sites surveyed in the Fort Chipewyan study area. Seven of the eight occupied sites produced fledged young. The number of occupied sites held by territorial pairs has fluctuated between 10 and 12 since 1996. Ten young were confirmed fledged in 2002, which gives an average of 1.25 fledged young per territorial pair. The number of young fledged in 2002 represents an increase from 2000, when only four young were produced, but is lower than in other years with similar occupancy rates (since 1996).

Recommendations/Future Direction

By continuing to monitor the three study areas, managers will be able to detect any trends in occupancy or productivity that may be of concern for this sensitive species. Annual monitoring of the three study areas will detect any dramatic shift in population size and productivity without the associated cost of a complete regional survey. Relying on the national survey every five years to monitor occupancy and productivity does not provide an accurate assessment of the population. Peregrine productivity can fluctuate dramatically from year to year because of events that the five-year survey would not detect (e.g., severe weather); therefore, annual monitoring is necessary to detect whether a significant trend is developing.

The FWD, WBNP and the Canadian Wildlife Service intend to develop a Memorandum of Understanding that will commit the three agencies to participate in the ongoing annual monitoring of three study areas in northern Alberta. The FWD will be involved in occupancy and productivity monitoring in the Fort Chipewyan study area. Annual monitoring will occur through the 2005 breeding season, and the need for continued monitoring will be assessed following the 2005 national survey.

COOPERATING AGENCIES

Alberta Conservation Association, Canadian Wildlife Service, Wood Buffalo National Park

For more information contact:

Matt Besko *(see page 7)*.

WESTERN AND EARED GREBES OF CENTRAL ALBERTA – INVENTORY, SURVEY TECHNIQUES AND MANAGEMENT CONCERNS

Project Supervisors: **Lisa Wilkinson, Hugh Wollis**

REGION:
Southwest

TARGET SPECIES:
Western Grebe (*Aechmorphorus occidentalis*), Eared Grebe (*Podiceps nigricollis*)

***WILDLIFE ACT* CATEGORY:**
Non-game Animals

PROVINCIAL GENERAL STATUS:
Sensitive: Western Grebe

Secure: Eared Grebe

COOPERATING AGENCIES

Alberta Conservation Association, Alberta North American Waterfowl Management Plan, Canadian Wildlife Service, TransAlta Utilities

For more information contact:

Lisa Wilkinson (*see page 7*) and see Species at Risk Report No. 60, Western (*Aechmorphorus occidentalis*) and eared (*Podiceps nigricollis*) grebes of central Alberta: 2002 field summary.

This report is available at: http://www3.gov.ab.ca/srd/fw/riskspecies/reports.html.

purpose | To gather data on western and eared grebes to help assess their status and provide direction for conservation and management.

Background

Western grebes and eared grebes are part of the family Podicipedidae, and are ancient species of diving specialists that rarely fly except to migrate. These grebe species are colonially nesting water birds that build precarious floating nests of aquatic vegetation. Both species have a wide distribution across western and central North America, with some colonies having thousands of nests. However, there is little information available on grebe colonies in Alberta, and it is suspected that they may be sensitive to human activity and development.

This study was designed to fill information gaps, refine survey protocols, initiate a monitoring program, and evaluate potential risks to colonies. Emphasis was on western grebes, which are considered *Sensitive*. This project has an educational component, using presentations and interpretative signs to inform people about the importance of shoreline habitat to a suite of species.

Methods

In 2001, survey protocols were refined and a baseline inventory of lakes populated by colonial grebes in the Stony Plain area was conducted. In 2002, effort was focused on the primary western and eared grebe populations identified in 2001. Ground nest surveys were used to estimate reproductive parameters (surveying transects instead of entire colonies to minimize disturbance). Total nest counts were conducted at the end of the nesting period to derive a total breeding adult population estimate. Measurement of reproductive parameters will be repeated after five years, and post-reproductive nest counts will be conducted annually.

Results

The regional population of western grebes was estimated at approximately 2611 adults on six lakes; breeding colonies were observed on three of these lakes. Overall, numbers and locations of nesting colonies were similar to the findings from the 2001 surveys. Western grebes inhabiting Wabamun Lake and Lac Ste. Anne continue to be the dominant populations in the study area, representing 57.8% and 30.7% of the regional population, respectively. Population estimates for the Wabamun Lake colony increased by nearly 35%, whereas estimates for the Lac Ste. Anne colony declined by nearly 37%. The Isle Lake population size remained relatively stable from 2001 to 2002. One new population of western grebes was identified on Sandy Lake, where breeding was likely occurring but not confirmed. Maximum mean clutch sizes for western grebe colonies ranged from 2.71 to 2.95 eggs per nest (n=581 nests, three colonies), which is within the range reported in the literature. The maximum proportion of active nests ranged from 89.8% to 95.0%. However, the Wabamun Lake colony continued to show signs of poor nesting success, which is likely a result of high rates of nest predation by corvids. This is a major concern because this colony is ranked as nationally significant.

Surveys for eared grebes were conducted on 13 lakes, of which 10 had eared grebes, resulting in a conservative population estimate of 8459 adults. Although the survey of the study area was not as thorough as in 2001, the 2002 overall population estimate was higher than the 2001 regional population estimate of 7632 adults. The George Lake eared grebe population was the largest (5000+ adults), up 38% from 2001. Nesting was confirmed on five lakes: George Lake, Isle Lake, Lac Ste. Anne, Oldman Lake and an unnamed lake south of Sandy Lake. Owing to logistical constraints, nesting success was only assessed for the George Lake and Isle Lake colonies. The mean clutch size ranged from 2.55 eggs per nest to 3.46 eggs per nest, and the proportion of active nests ranged from 81% to 100%. Both colonies are considered nationally significant because of their size.

Recommendations/Future Direction

Both western and eared grebes appear to prefer shallow and undeveloped lakes and generally avoid developed water bodies, or avoid nesting in areas of high human activity within a water body. The increasing destruction of reed habitat could have serious impacts on western grebe colonies, which rely on shoreline vegetation for nesting and have more fidelity to breeding sites than do eared grebes. They are also more reliant than eared grebes on large water bodies, where human activity is often high. Consequently, public education about shoreline conservation is an important and ongoing component of this project.

POPULATION SURVEY OF AQUATIC MOLLUSCS IN ALBERTA'S CENTRAL PARKLAND NATURAL SUBREGION

Project Supervisor: **Dave Prescott**

REGION:
Southeast

TARGET SPECIES:
Aquatic gastropods and bivalves

***WILDLIFE ACT* CATEGORY:**
None

PROVINCIAL GENERAL STATUS:
In Preparation

purpose

To establish the distribution and relative abundance of many species of aquatic molluscs in Alberta's Central Parkland Natural Subregion and thereby clarify the general status of many of these species.

Background

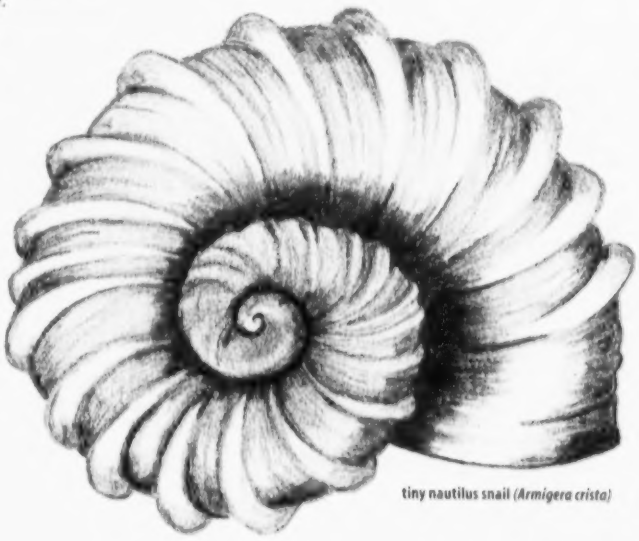
One group of ecologically important organisms that has been largely overlooked in Alberta is the aquatic molluscs (bivalves and gastropods). Both bivalves and gastropods are widely distributed and relatively common in a variety of still-water and flowing-water wetland types in Alberta. Molluscs form an important food source for many semi-aquatic and terrestrial organisms and are also intermediate hosts for a variety of fish and waterfowl parasites. In addition, many gastropods are filter feeders and toxic substances can concentrate in their tissues. This, along with molluscs' sensitivity to hydrological regimes (e.g., oxygen, nutrients, temperature), makes them excellent bio-indicators of environmental health in landscapes influenced by activities such as pulp mills, irrigation, hydroelectric dams, deforestation and agriculture.

Despite their importance in wetland systems, the only significant work on aquatic molluscs in Alberta to date occurred in the 1960s, when specimens were collected at 87 stations over three field seasons. As a result of this work, 28 species of bivalves and 50 species of aquatic gastropods were identified in Alberta, with the vast majority of these occurring in the Central Parkland Natural Subregion. Many of these species, however, are known only from a very few sites, and information on most species is too limited to accurately determine their range, habitat requirements and biological status.

This project consists of a large-scale inventory of bivalves and aquatic gastropods from a wide variety of water bodies in the Central Parkland Natural Subregion of Alberta. The work will be only the second effort to characterize aquatic mollusc populations over a large geographical area of Alberta, and will build upon previous work by providing an increased sampling effort and relating the distribution of species to the chemistry and physical attributes of wetlands.

Methods

During the summer of 2001, 196 sites were sampled for aquatic molluscs. All mollusc



tiny nautilus snail (*Armigera crista*)

(illustration courtesy of M.Curteanu)

samples were cleaned and stored in jars of 75% ethanol in a dark and cool area. Starting in 2002, bivalves were separated from gastropods and placed in separate labelled vials for future identification. Terrestrial gastropods were also separated into different vials. Sand and debris were removed from the inside of each shell because small species can be found mixed in with the substrate. To identify species, shells were viewed under a dissecting microscope and specific shell characteristics (e.g., shell height, diameter, width, aperture height and width) were measured with calipers.

To aid in identification, a dichotomous key was developed, based primarily on the classification and descriptions of Clarke (1981). Various other guides were also consulted, as were specimens of known identity obtained from various museums and universities. Individuals were counted, classified to species, and denoted as "alive" when more than half of the lot of a particular species had an animal within the shell, or "dead" when more than half of the lot had no animal within the shell. Juveniles were counted when positive identification was possible, especially if adults were present in the lot. Specimens that could not be immediately identified were placed in different vials for future consideration.

Results

As of March 2003, identification of the gastropods in almost all 196 samples had been completed. Analysis of bivalves has been deferred until sufficient resources become available. Repeat examination of numerous samples is now being conducted to clarify identification of specimens classified as "unknown" in the initial analysis.

So far, at least one new species has been discovered for Alberta, and most species listed by Clarke (1981) for the Central Parkland Natural Subregion have been encountered. When the analysis is completed, a full report will be prepared.

Recommendations/Future Direction

Analysis of aquatic gastropods is nearly complete, although modest amounts of funding will be required to finalize the remaining tasks. Analysis of bivalves will proceed when substantial new resources have been secured.

COOPERATING AGENCIES

Alberta Conservation Association, Alberta North American Waterfowl Management Plan, Manitoba Museum, Provincial Museum of Alberta, University of Michigan, private consultants

For more information contact:

Dave Prescott (*see page 7*).

RESPONSES OF ORD'S KANGAROO RATS TO PIPELINE CONSTRUCTION

Project Supervisor: **Arlen Todd**
Project Researcher: **David Gummer** (Provincial Museum of Alberta)

REGION:
Southeast

TARGET SPECIES:
Ord's Kangaroo Rat (*Dipodomys ordii*)

***WILDLIFE ACT* CATEGORY:**
Endangered

PROVINCIAL GENERAL STATUS:
May Be At Risk (*general status rank will be updated in 2005*)

purpose

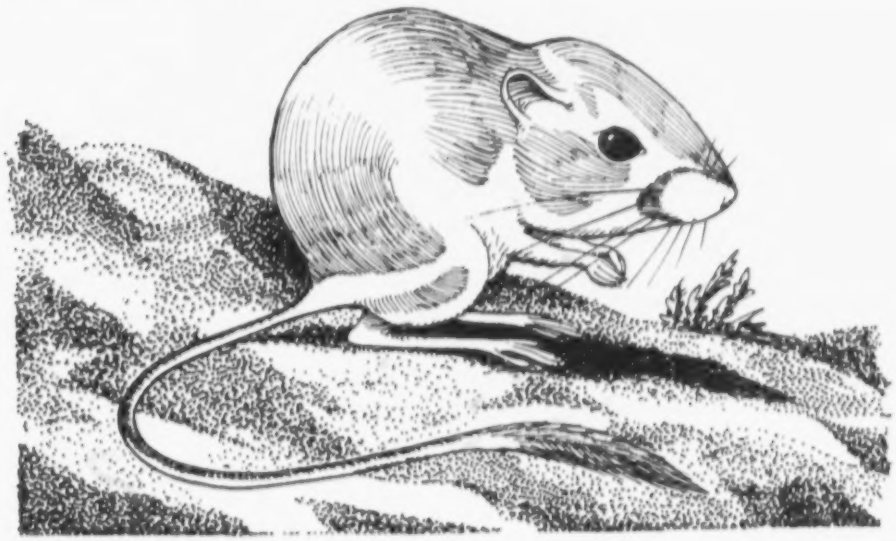
To compare survival rates, home range sizes, reproductive status and foraging rates between kangaroo rats at a site where pipeline construction occurred during the previous year (2001) and at an undisturbed (control) site.

Background

Ord's kangaroo rats occur in Alberta in a small geographical area at the northernmost periphery of the species' range. Long-term geographic isolation at relatively high latitude appears to have caused northern kangaroo rats (i.e., in Alberta and Saskatchewan) to adopt some distinct characteristics that increase their chances of survival (hibernation, rapid sexual maturity). However, the population in Alberta crashes in most winters. So, any disturbances that directly or indirectly increase mortalities of kangaroo rats have the potential to rapidly extirpate small, local populations, leaving the overall Alberta population close to extinction.

The North Suffield gas pipeline was constructed across the geographic range of the kangaroo rats in Alberta during 2001. Special mitigation measures and monitoring efforts were implemented for the species during construction and reclamation. Specific mitigation for kangaroo rats included marking and avoidance of kangaroo rat burrow locations to minimize crushing or collapsing burrows, prohibiting trucks and large vehicles on the right-of-way wherever kangaroo rats were known to occur, and prohibiting nighttime construction activities and illumination wherever kangaroo rats were known to occur.

Over the short term, mitigation proved to be effective at preventing direct and indirect mortalities of kangaroo rats, as determined by mark-recapture and radio telemetry monitoring. However, kangaroo rats that were exposed to pipeline construction had smaller home ranges, shorter aboveground movements, and were less likely to hibernate as compared to kangaroo rats that were not exposed to pipeline construction. Hence, it was hypothesized that pipeline disturbance may have caused resident kangaroo rats to rely too extensively on their underground food caches during 2001, which could result in



Ord's kangaroo rat

detrimental effects on individuals and the population during the ensuing year.

Methods

Located in the Middle Sand Hills, the pipeline study site was on an east-facing, west slope of the South Saskatchewan River valley and the "control" study site was 13.1 km away in Suffield National Wildlife Area on a southeast-facing, west slope of the South Saskatchewan River valley. The control study site provided a comparable population of kangaroo rats at high densities in a wildlife refuge in the easternmost portion of Canadian Forces Base Suffield, thereby ensuring that no other industrial disturbances confounded comparisons.

Nighttime surveys for kangaroo rats were conducted by vehicle and on foot. Vehicle surveys involved driving slowly (30 km/h) with the headlights on and using spotlights (10^6 candle power) to scan the edges of vegetation along roads, trails and firebreaks for kangaroo rats ("nightlighting"). Vehicle surveys effectively searched transects that were approximately 20 m in width. Potential habitats that were not accessible by vehicle were surveyed on foot using bright flashlights to search for kangaroo rats, footprints, tail drags and burrows.

Field observations were georeferenced using a handheld Global Positioning System. When kangaroo rats were observed, they were pursued on foot and caught by hand. Where kangaroo rats proved difficult to hand-capture or habitats appeared difficult to survey effectively by nightlighting, baited metal live traps were set intensively at burrow locations. Individual kangaroo rats were identified with one uniquely numbered metal ear tag and a subcutaneous microchip. Date, time, sex, age, mass, reproductive status, cheek pouch status, presence/absence of ectoparasites, ear tag number, microchip identifier and UTM coordinates were recorded for each kangaroo rat that was caught.

Results

Forty-seven nights of nightlighting surveys were completed from 11 June to 31 August 2002, including 2665 km of linear habitats (trails, fireguards). Workers made 551 georeferenced records of kangaroo rats, including repeated captures of 242 individuals that were identified with numbered ear tags and subcutaneous microchips. Neither winter survival nor summer survival differed among kangaroo rats at the pipeline and control study sites. Also, kangaroo rats were equally likely to be reproductive at the pipeline and control sites. Home range sizes, maximum known foray distances, and foraging rates did not differ among kangaroo rats at the pipeline and control study sites, although all three of those variables were significantly higher at the pipeline site in 2002 than in 2001. It appears that specific mitigation measures implemented for kangaroo rats during pipeline construction were sufficient to protect resident kangaroo rats from measurable direct and indirect harm for at least one year after construction.

Recommendations/Future Direction

Given the success of the mitigation strategies used in this study, it is recommended that these measures become the standard minimum mitigation requirements for future industrial activities within the geographic range of kangaroo rats in Alberta. Again, the measures employed here, and recommended for elsewhere, include locating and visibly marking burrows so that they can be avoided; prohibiting large vehicles on the right-of-way; and prohibiting nighttime construction activities and illumination (work lights) wherever kangaroo rats are known to occur.

COOPERATING AGENCIES

Canadian Forces Base Suffield, Provincial Museum of Alberta

For more information contact:

Arlen Todd (*see page 7*) or **David Gummer** (David.Gummer@gov.ab.ca) and see Species at Risk Report (in prep.), Examination of effects of pipeline construction on activities and survival of Ord's kangaroo rats.

SURVEY PROTOCOL FOR THE RICHARDSON'S GROUND SQUIRREL

Project Supervisor: **Richard Quinlan**
Project Technician: **Brad Downey** (ACA)

REGION:
Provincial (conducted in Southeast)

TARGET SPECIES:
Richardson's Ground Squirrel (*Spermophilus richardsonii*) and Ferruginous Hawk (*Buteo regalis*)

***WILDLIFE ACT* CATEGORY:**
Threatened: Ferruginous Hawk

Non-licence Animal: Richardson's Ground Squirrel

PROVINCIAL GENERAL STATUS:
At Risk: Ferruginous Hawk

Secure: Richardson's Ground Squirrel

purpose

To review the biology and ecology of Richardson's ground squirrels and to develop a survey method to determine yearly trends in the population density of this species in Alberta and compare these trends with those in the ferruginous hawk populations.

Background

Richardson's ground squirrels are distributed throughout the grasslands and are a key component of the prairie ecosystem. Richardson's ground squirrels are a vital prey source for ferruginous hawk, Swainson's hawk (*Buteo swainsoni*), prairie falcon (*Falco mexicanus*), prairie rattlesnake (*Crotalus viridis*), American badger (*Taxidea taxus*) and long-tailed weasel (*Mustela frenata*). Their burrows also provide refuge and shelter for burrowing owls (*Athene cunicularia*), bumblebees, several species of snakes, and small mammals. It is important to survey for prey species to identify their influence on the predator species that are closely linked to them. Richardson's ground squirrels also play an important role in the overall biodiversity of the grassland ecosystem. A consistent and practical system of monitoring ground squirrel populations is required.

Methods

The biology and ecology of Richardson's ground squirrel was summarized. A review of possible inventory protocols was carried out which highlighted three survey methods: burrow entrance counts, mark-release-recapture, and point count visual surveys using call playback. The effectiveness, necessary time allocation, staff requirements, cost and precision were assessed for each method.

Results

Point site visual surveys were developed and will be performed in conjunction with ferruginous hawk quadrat surveys (*see page 18*). Surveying for both species together may help us to understand how ferruginous hawk populations fluctuate with changes in the ground squirrel population. Surveys will be conducted during the first three weeks of April to ensure that all adult ground squirrels will have emerged from hibernation and will be above ground. This will allow the maximum adult density to be assessed each year. The point site surveys involve an observer driving and stopping every 800 m along a 12.8 km (8 mi.) predetermined transect. One 12.8 km transect will be surveyed yearly in 30 of the existing ferruginous hawk blocks, with five to eight blocks being located in each of four Fish and Wildlife areas (Hanna, Brooks, Lethbridge and Medicine Hat) and an additional two ferruginous hawk blocks in the Foothills Fescue Natural Subregion (Figure 1).

Figure 1. Location of ferruginous hawk blocks with Richardson's ground squirrel transects.

Point count surveys will include an initial two-minute observation period followed by a two-minute playback of an adult Richardson's ground squirrel alarm call. A comparison will be carried out to determine whether playback of alarm calls assists in increasing the number of ground squirrels observed. The observer will record other species of interest encountered at the stop (e.g., loggerhead shrike [*Lanius ludovicianus*] and upland sandpiper [*Bartramia longicauda*]) and species that may affect a ground squirrel colony (e.g., American badger and coyote [*Canis latrans*]).

Recommendations/Future Direction

The Alberta Richardson's ground squirrel inventory will be carried out annually on ferruginous hawk quadrats. Monitoring areas have been distributed to facilitate involvement of Fish and Wildlife Division area wildlife biologists on an annual basis. The Richardson's ground squirrel and ferruginous hawk monitoring programs need to be recognized as part of the annual work program of these staff members in order to ensure ongoing data collection.

COOPERATING AGENCIES

Alberta Conservation Association

For more information contact:

Richard Quinlan (*see page 7*) or **Brad Downey** (Brad.Downey@gov.ab.ca), and see Species at Risk Report No. 69, Survey protocol for the Richardson's ground squirrel.

This report is available at: http://www3.gov.ab.ca/srd/fw/riskspecies/reports.html.

ASSESSMENT OF WOLVERINE DENSITIES AND MONITORING METHODS IN ALBERTA – 2002-2003

Project Supervisors: **Jason Fisher** (ARC), **Larry Roy** (ARC), **Lisa Wilkinson, Matt Besko**

REGION:
Provincial (conducted in Northwest)

TARGET SPECIES:
Wolverine (*Gulo gulo*)

***WILDLIFE ACT* CATEGORY:**
Fur-Bearing Animal
(*ESCC Recommendation: Data Deficient*)

PROVINCIAL GENERAL STATUS:
May Be At Risk

purpose

To evaluate and calibrate long-term methods of population monitoring, and to provide preliminary data on wolverine density that will pilot the implementation of a province-wide wolverine ecology study and monitoring program.

Background

The wolverine has experienced considerable population reduction and range retraction across North America since European occupation. In eastern Canada, the wolverine has declined dramatically, to the point of extirpation from several areas. In 2003, the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) reconfirmed the status of the eastern population of wolverine as *Endangered* (COSEWIC 2003). The western population has also been substantially reduced, and has been listed as a species of *Special Concern* (COSEWIC 2003). In Alberta, wolverines still inhabit the mountains, foothills and boreal plain, but numbers are suspected to be low. The wolverine has been recommended by the Endangered Species Conservation Committee as *Data Deficient* in Alberta, delineating a need for further information on this species.

Wolverine have naturally low reproductive rates and low juvenile survivorship, and require a large and variable home range based on food availability and habitat suitability. These factors contribute to their normally sparse distribution and low population size. There has never been an inventory of wolverine population size, distribution, demographics or habitat use in the boreal regions of the province. No data exist on wolverine densities in the boreal forest, which represents a sizeable portion of the species' global range.

Methods

Monitoring for wolverine occurred in two areas during 2002-2003. Twenty-one stations were located in the Chinchaga area of northwestern Alberta, within and around the Manning Diversified Forest Products Forest Management Agreement. Analysis of trapping reports had identified the Chinchaga area as having the highest density of wolverines in the Alberta boreal forest. To provide cross-regional comparison, eight stations were also located in the vicinity of Grande Cache, Alberta.

Within these two expansive study areas, monitoring stations were established where wolverines were known or suspected to occur, using a stratified systematic approach based on topography, habitat and known locations of wolverines. Stations were located in conifer stands or in conifer-dominant mixedwood stands, at points of high elevation relative to the local landscape.

Several monitoring methods were employed simultaneously, to calibrate the efficacy and feasibility of each, and to obtain a measure of the functional equivalent of trapability for each method.

Hair capture

Genetic "fingerprints" can be detected from hair samples, allowing researchers to identify individual wolverines. A Fish and Wildlife Division investigation into the feasibility of a hair collection protocol indicated that this technique showed promise as a tool for population monitoring; wolverine hair samples were collected at several stations.

A hair corral was erected at each monitoring site. Corrals made of high-tensile steel barbed wire were rigged with scent lures and a no-reward bait system (to eliminate the possibility of losing bait soon after setting the corral, and to reduce multiple visits from a single animal). A second hair trap was erected at each site in a conifer tree with many small branches growing from the bole. A slicker dog grooming brush and a 2-in. steel wire brush were nailed to the bole. The effectiveness of the brush traps at capturing hair was compared with the hair capture rate in the corrals.

Camera traps

Hair capture rate is not, in itself, a reliable measure of the efficacy of hair corrals; therefore, camera traps were installed within each hair corral, to provide data by which to calibrate hair capture rates. Camera trap data can also be used as a relative indicator of wolverine activity to compare across areas, or across years. Infrared remote camera systems were set up at each hair corral. The infrared transmitter and receiver were arranged such that an animal visiting the bait station would break the infrared beam, signalling the camera to take a picture.

Snow tracking

Snow tracking can also be a reliable way of obtaining indices of wolverine activity. Permanent transects 10-20 km long in the vicinity of each site were established and surveyed once each session to monitor frequency and abundance of wolverine tracks. Surveys were only conducted 24-72 hours after a fresh snowfall, if tracks were not melted out or

blown in. The number of observations of linear track segments seen per 100 kilometres travelled provides a relative index of wolverine abundance. In addition to these transect surveys, snow tracking in a 10-m radius around each monitoring station was performed to look for evidence of animals visiting the corrals and/or brush traps.

Results

Monitoring stations were operational for a period of 12-32 days, depending on logistical constraints and environmental conditions; 21 stations were deployed for a total of 402 trap nights.

Hair capture

No hair was captured in the first session in Chinchaga because of a large snowfall that buried the hair corrals. No hair was captured by the corrals previous to this snowfall, nor from the tree brushes. In the second session in Chinchaga, hair was captured at two of the eight sites. Hair was obtained from the brush traps and one corral. In Grande Cache, hair was captured at three of the eight sites, obtained from one brush trap and two corrals. As of the writing of this report, the hair had yet to be identified to species or individual via genetic analysis.

Camera traps

As with the hair corrals, a snowfall buried the camera systems during the first session in Chinchaga, resulting in the loss of one day from the sampling period. Despite this, one picture of a marten (*Martes americana*) was obtained. In the second session, pictures of martens, a fisher (*Martes pennanti*), two red squirrels (*Tamiasciurus hudsonicus*), and an unknown mustelid were obtained at four sites. In Grande Cache, pictures were obtained at seven of eight sites of fisher, lynx (*Lynx canadensis*), snowshoe hare (*Lepus americanus*) and gray jays (*Perisoreus canadensis*). No wolverine pictures were recorded. In several cases, pictures of animals were obtained but hair was not. A sign test (Zar 1996) revealed that cameras were significantly better than both corrals ($p<0.05$) and brush traps ($p<0.05$) at detecting presence of a mammal at a site.

Snow tracking

In Chinchaga, there was no snow during the first session, so no snow track surveying could be done at that time. In the second session, 125.9 km of roads were surveyed. No wolverine tracks were observed over any of the transects sampled, but lynx, wolf, marten and fisher tracks were noted.

In Grande Cache, 35.3 km of transects were surveyed. Conditions were excellent during the survey, with more than two days of fresh snow on the ground, and little wind or melt. Five different lengths of wolverine track were encountered at one site, while another yielded no wolverine tracks. Surveys were to continue from 3 to 5 March 2003, but snow squalls made conditions unsuitable. A second survey in Grande Cache was attempted between 12 and 15 March 2003, but unusually warm weather (12°C) again made conditions unsuitable.

Recommendations/Future Direction

Hair capture

Capture rate between brushes and corrals did not differ. Results may suggest that neither the corral nor brush is necessarily reliable as a stand-alone hair capture method. Results from the camera traps corroborate this hypothesis as well.

Logistically, the brush traps appear superior to the corrals. Because the corrals are built low to the ground, they are susceptible to occlusion by snowfalls, whereas brushes are not. Brushes require limited material and labour to erect; several brush stations could be erected in the same time required to erect one corral station.

Camera traps

The camera traps were successful in photographing marten, fisher, lynx, hare, gray jays and one red squirrel. There were some cases of unidentified agents triggering the system.

Cameras were significantly better at detecting the presence of a mammal at a station than were corral hair traps. There were nine cases where pictures were obtained where hair was not present on the corral trap; there were no cases of the reverse occurring. Statistical analysis suggests that corral traps, as currently designed, may not be effective monitoring tools. Animals are entering the corrals without leaving hair.

It should be noted that, like the hair corrals, camera systems were limited by snowfall when placed on the ground, decreasing the reliability of the system. Using the camera system on a tree, as the brushes were this year, would be a more feasible alternative.

Snow tracking

Snow tracking proved the most difficult survey method to complete and to standardize. Reliable data could be gathered only when conditions were suitable: 1-4 days after a snowfall, with no wind or temperatures above 0°C in the interim. As conditions varied between, and even within, days, obtaining suitable conditions was a difficult prospect. Nonetheless, snow tracking did detect wolverines where cameras did not. Five sets of wolverine tracks were noted at a site where neither pictures nor hair were captured. However, sample size is far too low to determine if this trend is statistically significant; more data are required.

In summary, more sampling is required to critically evaluate the efficacy of each method. A higher sampling intensity on a larger study area may produce statistically defensible results and direct future sampling efforts for a provincial wolverine inventory.

COOPERATING AGENCIES

Alberta Conservation Association, Alberta Research Council, Manning Diversified Forest Products

For more information contact:

Jason Fisher (FisherJ@arc.ab.ca) and see Species at Risk Report No. 71, Testing methods for detecting wolverine.

This report can be found at http://www3.gov.ab.ca/srd/fw/riskspecies/index.html.

WOODLAND CARIBOU CALF SURVEYS

Project Supervisor: **Dave Hervieux**

REGION:
Provincial (conducted in Northwest, Northeast)

TARGET SPECIES:
Woodland Caribou (*Rangifer tarandus caribou*)

***WILDLIFE ACT* CATEGORY:**
Threatened

PROVINCIAL GENERAL STATUS:
At Risk

purpose To determine woodland caribou population trends through annual aerial surveys.

Background

Woodland caribou occur at low densities and in clumped distributions, are cryptically coloured, and inhabit coniferous forests during the winter. These factors combine to make woodland caribou a difficult species to census. Long-term population trends are unknown; however, recent population studies suggest that most populations are declining.

Several woodland caribou populations are being studied as part of the Boreal Caribou Committee and West Central Alberta Caribou Standing Committee research programs. Through these initiatives, large numbers of female caribou have been radio-collared to collect information on recruitment, survival and mortality. These data are the only means currently available to track population trends and compare areas with varying degrees of industrial development. Some of these caribou populations are experiencing considerable amounts of disturbance from industrial activities. Aerial surveys are the key method of determining herd health.

Methods

The Boreal Caribou Committee (BCC) is monitoring eight different ranges in northern Alberta (west side of the Athabasca River (WSAR), east side of the Athabasca River (ESAR), Caribou Mountains, Red Earth, Cold Lake Air Weapons Range (CLAWR)—Alberta and Saskatchewan sides, Chinchaga and Slave Lake).

Aerial surveys were conducted in February and March to determine calf recruitment in all major caribou ranges under study in 2003, except in the Cold Lake Air Weapons Range. Calf survival to one year of age (recruitment) is determined by late winter helicopter surveys. Groups of caribou are located using radio-collared cows and then all caribou within the group are surveyed and classified as to age (adult versus calf), and the sex of adults is determined. The general condition of all caribou observed is assessed. Information from the spring calf survey is used with data on adult survival to determine the rate of population change. The locations of all caribou seen were entered into the Biodiversity/Species Observation Database.

Results

Results of the 2003 calf recruitment surveys with a comparison to previous surveys are presented in Table 1. In March, calves are only about 10 months of age, so the values from calf surveys represent an optimistic view of recruitment. The average values presented in the table represent the average calf recruitment per range from the inception of the surveys in that range up to and including 2002.

Table 1. Calf recruitment in BCC Study areas (calves per 100 cows)

Study Area	1994	1995	1996	1997	1998	1999	2000	2001	2002	Ave	2003
WSAR	28	22	20	29	36	26	18	17	15	**23**	18
ESAR	10	22	20	15	N/S	37	28	11	18	**20**	17
Red Earth		9	25	18	46	15	12	16	8	**19**	19
Caribou Mtn		11	16	24	10	12	7	6	20	**13**	24
CLAWR AB						19	14	6	10	**12**	n/s
CLAWR SK						32	19	13	28	**23**	n/s
Chinchaga									34	**34**	11
Slave Lake									52	**52**	19

In most ranges being monitored, calf recruitment is substantially lower in 2003 than the average value for the range for previous years. Calf production (in May) has been consistently high, based on monitoring of radio-collared females. Low calf recruitment therefore appears to be related to high calf mortality rather than low production. Causes of calf mortality have not been researched in these ranges, but it is suspected that predation by wolves or black bears within the first several weeks of life may be a factor. Based on research of the BCC, it appears that linear corridors such as seismic lines, pipelines and roads may be increasing wolf hunting efficiency, and managers are concerned that this may be contributing to low calf recruitment.

Table 2 details the total numbers of caribou observed per range in the March 2003 calf recruitment survey, as well as the breakdown by age and sex. Age could only be reliably discriminated between calves (approximately 10 months old) and adults. Occasionally, owing to restricted visibility in certain habitats, the age or sex of some animals could not be determined.

Table 2. Breakdown of bulls, cows and calves observed in 2003 calf recruitment survey

Study Area	Cows	Bulls	Adults – Sex Unknown	Calves	Total	Collars Monitored *
WSAR	76	26	1	14	117	27
ESAR	89	13	1	15	118	23
Red Earth	85	30	0	16	131	23
Caribou Mtn	123	16	5	29	173	23
CLAWR AB	n/s	n/s	n/s	n/s	n/s	n/s
CLAWR SK	n/s	n/s	n/s	n/s	n/s	n/s
Chinchaga	54	22	4	6	86	22
Slave Lake	21	19	0	4	44	10

n/s – not surveyed

*all radio collars are deployed on adult female caribou except one bull in Red Earth, three bulls in Chinchaga and four bulls in Slave Lake

During March, adult bulls and cows tend to be spatially segregated. Radio transmitters have been deployed primarily on cows, resulting in an under-representation of the bull composition in the herds.

The total numbers of animals observed in each range provides an indication of the minimum population present in the range at that time. However, because the proportion of the population that is radio-collared and the proportion of the population observed are unknown, the numbers of caribou observed cannot be extrapolated to a total population estimate.

Recommendations/Future Direction

Woodland caribou have been a major management concern for wildlife and land managers and industrial operators within caribou ranges in Alberta for at least the last 20 years. A tremendous amount of time and resources have been invested into examining survival and recruitment, habitat use by caribou, and limiting factors within caribou ranges. In the short and long term, population trends are the only definitive tool available to judge the success of mitigation efforts that are undertaken relative to industrial land uses. To date, declining caribou populations in many of the Alberta ranges indicate that government and stakeholders have not resolved the issues faced by caribou populations. It is critically important that continued monitoring of population trends, of which calf recruitment surveys are a major component, occur on an annual basis. This monitoring should continue until wildlife managers are satisfied that caribou populations and habitat suitability and supply are being maintained.

woodland caribou

COOPERATING AGENCIES

Alberta Conservation Association

For more information contact:

Dave Hervieux
(Dave.Hervieux@gov.ab.ca).

WOODLAND CARIBOU RANGE RESTORATION PROJECT – 2002

Project Supervisor: **Matt Besko**

REGION:
Provincial (conducted in Northeast, Northwest, Southwest)

TARGET SPECIES:
Woodland Caribou (*Rangifer tarandus caribou*)

***WILDLIFE ACT* CATEGORY:**
Threatened

PROVINCIAL GENERAL STATUS:
At Risk

purpose

To speed the recovery of linear disturbances (roads, seismic lines and pipelines), so that their negative effects on woodland caribou, and other sensitive wildlife species, are reduced and eventually eliminated.

Background

Most caribou populations are declining, and research in Alberta has clearly shown that caribou respond negatively to linear developments. Caribou were found to avoid areas adjacent to seismic lines and roads, which reduces the availability and effectiveness of habitat in caribou ranges. Caribou were also found to cross roads less than expected, implying a barrier effect. Roads, pipelines and seismic lines enable humans to easily penetrate otherwise remote areas, which can lead to increased levels of hunting, poaching and trapping. Wolves, the main predator of caribou, seek out and travel faster along corridors than in adjacent habitat, and kill caribou near these lines.

The harmful effects of linear disturbances on wildlife have been widely documented. Ungulates, large and medium-sized carnivores and birds have been shown to respond negatively to linear development at an individual and/or population level. Up to 85% of some caribou ranges in Alberta are within 250 m of a linear disturbance. This highlights the need to restore natural habitat within the existing footprint of human activity on the landscape. "Natural" recovery of linear disturbances has been very slow in most caribou ranges. Actions taken to reduce access and encourage vegetative re-growth are needed and will benefit many other species, such as grizzly bear and wolverine, both of which require large areas of relatively undisturbed habitat, and bull trout, which are sensitive to fragmentation of their habitat by watercourse crossings.

A wide range of industrial, government and nongovernmental groups have shown interest in the first two years of this project, and this interest continues to expand. Substantial financial and in-kind support has been offered. This extensive broad-based support will ensure that sufficient human and financial resources are committed to the project to guarantee its successful completion.

Projects in 2002 focused on the Little Smoky, Redrock, Red Earth, Fort McMurray and Stony Mountain areas. In 2003, projects will continue in these areas, and additional ranges will be added.

Methods

A project committee as well as local planning teams were set up for each of the four project areas. These teams met as required and guided the restoration activities, monitoring and research that took place.

Researched treatments (e.g., mounding, tree planting) were integrated into the planning stages in order to overcome limiting factors in line reclamation. Experimental designs of new treatments were outlined for future study. An on-going experiment with the University of Alberta to test the effectiveness of tree falling and snow fences on wolf mobility and access reduction was implemented. An access control experimental design within a 3D-seismic program using tree felling and rollback over different distances, with and without signage, was initiated. An experiment to test the use of mulching (mowing) as a low-impact clearing technique and its potential as a revegetation site preparation aid (to enhance the re-growth of trees) was designed. An experimental design to test growth of non-typical species and winter transplants on test plots in Stony Mountain was implemented.

When choosing areas for restoration, local planning teams worked closely with key industrial players, Land and Forest Division, Fish and Wildlife Division and local trappers. Consideration is currently being given to attaching consultative notations to restored areas and protective notations to study plots, and outlining these areas on Fish and Wildlife referral maps. These steps will help to ensure that restored areas have the maximum potential for complete restoration.

Results

Red Earth

Transplants of black spruce, willow, rose and poplar and plantings of black spruce and white spruce plugs took place over approximately 55 km of linear disturbance throughout the area. Four snow fences were installed as part of a wolf mobility and control study.

Fort McMurray
Pine, black spruce, white spruce and poplar trees of various sizes were planted, reclaiming seismic lines and old winter access roads.

Stony Mountain
Although substantial planning and inventory occurred in the 2001-2002 season, all other restoration work in Stony Mountain will occur in 2003.

Little Smoky
Over 133 000 seedlings were planted along corridors. Tree felling and snow fences were used over 44 lines to discourage human and predator access as part of a study.

Redrock/Prairie Creek
Linear disturbances were scouted and classified for restoration.

Recommendations/Future Direction

The project, now in its third year, has effectively tested the various methods for site restoration and will now focus on monitoring the effectiveness of different treatment types. In addition, the predator use component of the project will be examined and tested in conjunction with the University of Alberta. Proposed operational activities for each range in 2003-2004 are as follows:

Red Earth
- Collaborate with industry for routing and access control planning, inventory, monitoring and restoration.
- Complete line evaluations and prescriptions for a minimum 35 km of lines within three new restoration areas identified during the fall and winter of 2002.
- Apply access control to an old 3D seismic site in a key caribou area.
- Restore 9-km high grade reclaimed licence of occupation road through Red Fish.
- Begin process of submitting restored lines and study areas for identification on Fish and Wildlife referral map, and implementing protective and consultative notations for selected lines.

Fort McMurray
- Set up mulching experimental design with industry.
- Begin scouting, classification and prescriptions of areas (mostly Stony Mountain).
- Provide the implementation of transplants within Petro-Canada's Meadow Creek test site.
- Continue negotiations with several energy and forest companies on what their contribution might be to the Caribou Range Restoration Project (CRRP) for the end of this winter, and in the future.

Little Smoky
- 135 500 tree seedlings will be planted by the beginning of July.
- Approximately 35 km have been chosen for reclamation.
- Continue to test the effectiveness of predator and prey access control on lines cutting through pipelines.
- Testing will be conducted on the survival of transplanting 2- to 6-year old tree seedlings.

Redrock/Prairie Creek
- 20 000 tree seedlings have been ordered and will be planted in late July, August
- Negotiations are ongoing with several energy companies on what their contribution might be to the CRRP in the future.

All areas will install information billboards on mainline roads into caribou protected areas and will continue line scouting and classification as the budget allows.

COOPERATING AGENCIES

Alberta Conservation Association, Alberta Newsprint Company, Alberta Sustainable Resource Development—Land and Forest Division, Alpac, Boreal Caribou Committee, Burlington, Canadian Association of Petroleum Producers, Canfor, Canterra, Conoco, Devon Energy, Exxon Mobil, Government of Canada Habitat Stewardship Program, Husky Energy, Petro-Canada, Seehta, Sharp, Suncor, Tempest Energy, Tera Environmental Consultants, Trans-Canada Pipelines, University of Alberta, West Central Alberta Caribou Standing Committee, West Central Oil & Gas Producers Group

For more information contact:

Matt Besko *(see page 7).*

BAT INVENTORY OF WEST-CENTRAL ALBERTA, 2002

Project Supervisor: **Lisa Wilkinson**

REGION:
Provincial (conducted in Southwest)

TARGET SPECIES:
Northern Myotis (*Myotis septentrionalis*), Long-legged Myotis (*Myotis volans*)

***WILDLIFE ACT* CATEGORY:**
Non-licence Animals

PROVINCIAL GENERAL STATUS:
May Be At Risk: Northern Myotis

Undetermined: Long-legged Myotis

COOPERATING AGENCIES

Alberta Conservation Association, North American Bat Conservation Partnership

For more information contact:

Lisa Wilkinson (*see page 7*).

purpose

To conduct an inventory of bats in west-central Alberta and provide status information.

Background

There is limited information on Alberta bat species, particularly in the northern part of the province. To this end, the provincial bat advisory group (Alberta Bat Action Team—ABAT) initiated a three-year bat inventory program, beginning with the northwest in 2000, the northeast in 2001, and the west-central region in 2002. These surveys are reconnaissance in nature and aim to identify species' presence and distribution, and possibly document habitat associations. In addition to conducting surveys, this program has attempted to increase the profile of bats through education to the public, stakeholders (i.e. industrial developers) and forest managers. In this third year of study, emphasis was placed on developing a presentation and associated resource materials for teachers, specific to the bats of Alberta.

There are nine bat species in Alberta, most of which occur in the north. Two species are of particular interest. The northern myotis is listed as *May Be At Risk* because of the limited number of occurrence records and the species' apparent reliance on old trees for roosts. The long-legged myotis is listed as *Undetermined* owing to limited records, and thus far has not been captured in the north. Industrial activity, particularly oil and gas exploration, oil sands development, and forestry, is rapidly increasing within the boreal forest and foothills of Alberta. Removal of trees has the potential to reduce the availability of bat roosting habitat.

Research from northern British Columbia and Alberta indicates that bats roost in mature or old deciduous trees, often in early stages of decay. Identifying species' presence is the first step toward appropriate management and conservation.

Methods

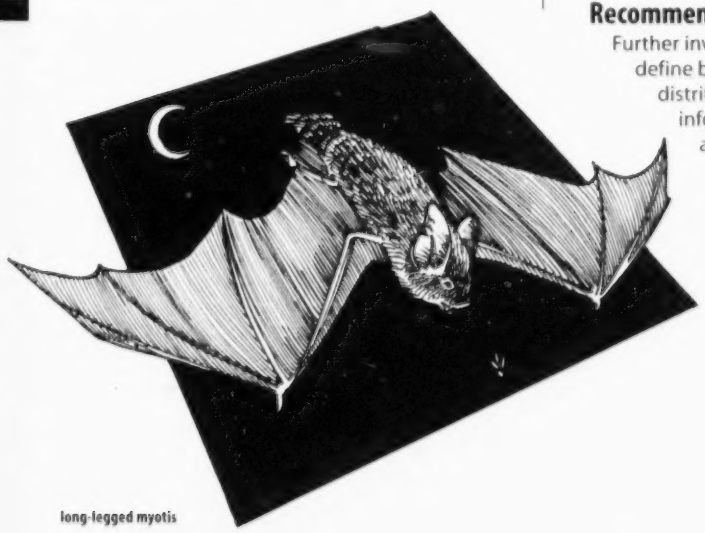
A reconnaissance bat survey of the west-central region of Alberta was conducted in 19 sites in 2002, using mist nets set across cut lines and trails and over small bodies of water, and bat detectors. Bat detectors were used as part of an acoustic survey to detect presence of species groups, and in some cases individual species, through echolocation calls. Data recorded on captured bats included species, sex, reproductive condition, age, mass and forearm length.

Results

Nineteen sites were sampled, and 11 little brown bats (*Myotis lucifugus*) were captured. With the exception of one juvenile female, all bats were adult males. Bat detectors recorded *Myotis* spp. and a small number of hoary (*Lasiurus cinereus*), silver-haired (*Lasionycteris noctivagans*) and big brown (*Eptesicus fuscus*) bats. Big brown and hoary bats are rarely captured in mist nets because they tend to forage above the tree canopy. Provincial bat educational materials and teaching tools were also developed.

Recommendations/Future Direction

Further inventory is needed to better define bat species' presence, distribution and habitat needs; this information is critical for appropriate management planning in an area that is increasingly affected by industrial development.



long-legged myotis

INVENTORY AND MONITORING OF NATURALLY OCCURRING WESTERN BLUE FLAG IN ALBERTA

Project Supervisor: **Richard Quinlan**

REGION:
Provincial (conducted in Southeast)

TARGET SPECIES:
Western Blue Flag (*Iris missouriensis*)

***WILDLIFE ACT* CATEGORY:**
None
(*ESCC Recommendation: Threatened*)

PROVINCIAL GENERAL STATUS:
In Preparation

purpose

To coordinate with landowners to investigate and inventory newly reported western blue flag sites, to inventory all western blue flag sites with previous counts fewer than 500 stems, to develop and implement an ongoing inventory and monitoring program for western blue flag at all sites and to provide a revised population estimate of naturally occurring western blue flag in Alberta.

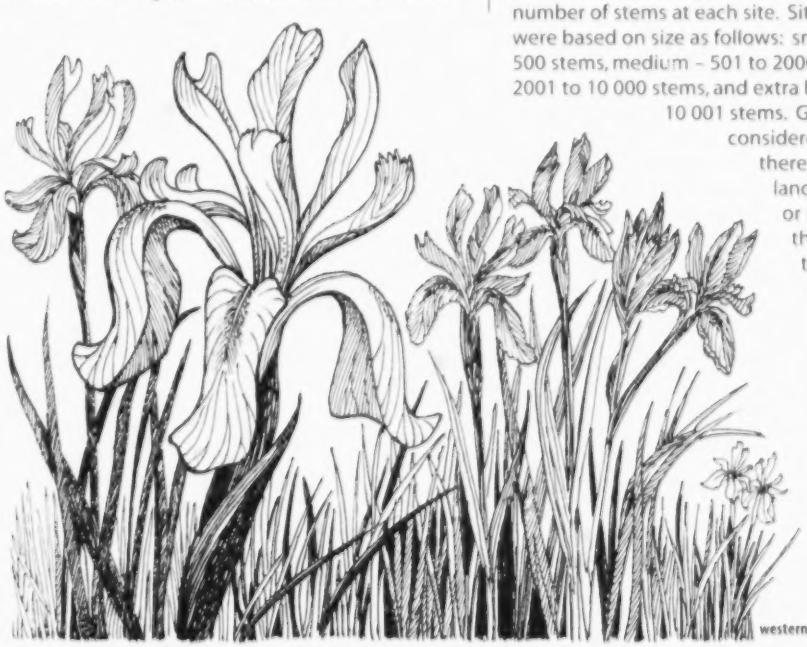
Background

In Canada, naturally occurring populations of western blue flag (*Iris missouriensis*) are restricted to the southwestern corner of Alberta, and are generally limited to the transitional zone between wet meadows and dry upland sites. An apparent decline in population size and numbers of populations, combined with a limited range and abundance in the province, led to the recommendation by the Endangered Species Conservation Committee that this species be listed as *Threatened* under Alberta's *Wildlife Act*. This recommendation was approved by the Minister of Sustainable Resource Development. In 2000, the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) upheld the national listing for western blue flag as *Threatened* (COSEWIC 2003).

A census was conducted in 2000, based on known western blue flag locations, and it resulted in a revised population estimate of 9275 stems. In 2001, a newly discovered site was inventoried, raising the total stem count to 14 757. Subsequently, a committee made up of various stakeholders, including area ranchers, was formed, and a maintenance and recovery plan was developed during late 2001 and early 2002. Major objectives of the plan included a revised census of western blue flag based on information regarding new sites, and the development of an ongoing inventory and monitoring program.

Methods

A western blue flag inventory and monitoring protocol was developed, based on the total number of stems at each site. Site designations were based on size as follows: small – fewer than 500 stems, medium – 501 to 2000 stems, large – 2001 to 10 000 stems, and extra large – more than 10 001 stems. Generally, sites are considered separate if there is a different landowner involved, or if the site is more than 500 m from the next nearest clump or stem. The two small sites at Police Outpost Provincial Park (POPP) were exceptions and treated separately



western blue flag

because they were being managed differently (i.e., treatments were being applied to one but not the other).

Small and medium sites were inventoried through a total stem count. Large and extra large sites were evaluated through a grouping method. It was impractical to count each individual stem on the larger sites, owing to the large number of stems involved and because the stems were spread over a large area. Instead, estimates were developed based upon grouping plants by tens or hundreds. Long-term monitoring plots were established to monitor the vigour of western blue flag over time.

The number of monitoring plots for each site was selected by site size and variability, and was determined as follows: small sites – one for each 250 stems; medium sites – one for each 500 stems; large sites – one for each 1000 stems; and extra large sites – one for each 2000 stems. Where possible, discrete clumps were chosen to facilitate monitoring. Clumps were selected for monitoring to get an assortment of clump sizes in a variety of different habitats.

Monitoring plots were marked by four wooden stakes around the perimeter (with the plot number on one stake), the location was recorded using a Global Positioning System unit, and the plot was measured on two axes (N/S and E/W). Total stems and flowering/fruiting stems were counted, site vigour was evaluated, associated species were noted, and a photo was taken of the plot.

Results

In 1989, the population of western blue flag was estimated as 7500 stems at six sites. A number of new sites were discovered in 2000 and 2001, and the 2001 population was estimated as 14 757 stems at 11 sites. In 2002, five additional landowners agreed to participate in the program to inventory and monitor western blue flag sites. New site stem totals, as well as increases at previously inventoried sites, raised stem counts to 59 200 in 2002. All of the previously inventoried sites showed increases in 2002, likely because of an abundance of spring moisture.

Recommendations/Future Direction

Although new populations of western blue flag have been discovered, the species remains restricted in range and has specific habitat requirements, and the majority of known populations occur on private land. Conserving western blue flag habitat through landowner cooperation and involvement is critical to maintaining western blue flag populations in Alberta. Specific objectives include the following:

- The maintenance and recovery plan calls for a formal review of western blue flag status if landowners report numerous additional sites. All of the new sites inventoried in 2002 are within the species' original range; however, the population has increased fourfold following the inventories completed in 2002. A review of western blue flag status is warranted based on the substantial increase in the population.
- The Whiskey Gap and POPP sites should be inventoried annually and the plots established at all other sites should be monitored annually. If site trend is down by more than 10% from the count done in 2002, a total stem count should be done.
- There is a need to continue to search for new sites with the cooperation of landowners, and to continue the cooperative approach with landowners to conserve western blue flag sites.
- On sites where western blue flag has been grazed and there are livestock fatalities, a necropsy should be conducted on the carcasses to determine if there is any link between the livestock deaths and the grazing on western blue flag.

COOPERATING AGENCIES

Alberta Conservation Association, Government of Canada Habitat Stewardship Program, Police Outpost Provincial Park, landowners in the Cardston area

For more information contact:

Richard Quinlan (*see page 7*) and see Species at Risk Report No. 66, Inventory and monitoring protocol for naturally occurring western blue flag (*Iris missouriensis*) in Alberta.

This report is available at: http://www3.gov.ab.ca/srd/fw/riskspecies/reports.html.

INVENTORY OF WESTERN SPIDERWORT IN ALBERTA, 2002

Project Supervisors: **Joel Nicholson, Sue Peters** (ACA)

REGION:
Provincial (conducted in Southeast)

TARGET SPECIES:
Western Spiderwort
(*Tradescantia occidentalis*)

***WILDLIFE ACT* CATEGORY:**
None
(*ESCC Recommendation: Endangered*)

PROVINCIAL GENERAL STATUS:
May Be At Risk

purpose To provide an updated population estimate and status information for western spiderwort in Alberta, in order to support the development of a provincial recovery plan.

Background

Western spiderwort is a perennial flowering plant with a slender stem and linear leaves. The flowers, which usually appear in early July, have rose to dark blue petals arranged in groups of three. Western spiderwort's unusual name comes from the soft, stringy material that can be pulled from the broken ends of the stem. After exposure to air, this material hardens into a thread that appears similar to a cobweb.

The Endangered Species Conservation Committee (ESCC) has recommended that western spiderwort be designated as *Endangered* because of concern over its small population in Alberta, which is isolated from populations in the United States and Saskatchewan; its fluctuating population size; and the decreasing availability of its sand dune habitat. These concerns, combined with the threat of invasion by leafy spurge (*Euphorbia esula*) into western spiderwort habitat in other parts of Canada, led to the listing of western spiderwort as *Threatened* by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) in 1992 (COSEWIC 2003). The species was reassessed and the designation confirmed in 2002 (COSEWIC 2003).

In Alberta, western spiderwort is known to occur in only one area in the southeastern corner of the province—the Pakowki Lake Sandhills close to the town of Manyberries. This area is part of the Dry Mixedgrass Natural Subregion of the Grassland Natural Region. The small population has been monitored sporadically since 1986. The size of the spiderwort population in this area has varied from year to year, depending on moisture levels. A population trend has therefore been difficult to determine.

In Canada, western spiderwort is at the northern limit of its range. Besides the population in Alberta, the species is found at one location in southern Saskatchewan and at three sites in southwestern Manitoba. The populations in Alberta and Saskatchewan are widely separated from each other (by approximately 350 km) and from the nearest populations in the United States, where the species is common.

Methods

Inventories were conducted from 3 to 12 July 2002. The area containing the previously known population was searched, as well as the surrounding habitat northeast of Pakowki Lake ("Pakowki Lake North"). Two additional locations with suitable habitat were also surveyed, including the sandhills southeast of Pakowki Lake, and sandhills close to Onefour, near the Lost River. Alberta's Dry Mixedgrass Natural Subregion contains other potential habitat for western spiderwort that could not be searched in 2002 because of time constraints.

For each plant, the number of stems and any evidence of browsing were recorded, as well as whether or not the plant was a reproductive individual (i.e., whether the plant had at least one flower or at least one developing capsule). The number of flowers per plant and the number of developing capsules (seed-bearing structures) per plant were recorded for a large subset of plants (n = 740). A "plant" is defined as a clump of multi-stemmed shoots. The boundaries delineating each continuous patch of western spiderwort plants were recorded using a Global Positioning System unit, so that the approximate area of each patch could be determined.

The results of the 2002 inventory were entered into the Alberta Natural Heritage Information Centre database of plant occurrences.

Results

In 2002, the presence of western spiderwort was confirmed only at Pakowki Lake North, where the total Alberta population was estimated to be approximately 7450 plants. This is a significant increase from the 2001 estimate of 20 plants in late June and only seven by mid-July. The 2002 population was also substantially larger than any other previous estimate, with the highest being 210 individuals in 1990—a very wet year. The small area enclosing the previously known part of the population contained only 16 plants, thus most of the 2002 spiderwort population was in new areas of the Pakowki Lake North site. The large 2002 population was likely attributable to high spring moisture in southeastern Alberta.

The plants were found in an area of approximately 0.02 km^2, and the total area encompassing all patches of plants plus the area between them was approximately 2.0 km^2. Despite the large number of spiderwort plants found, they were considered to be part of a single population.

In 2002, approximately 95% of the western spiderwort plants were reproductive and 89% of the population had seeds developing—an

indication of good future population potential. Browsing was patchy, ranging from 0-44% (average 15%) of plants within different subpopulations.

Western spiderwort was found growing in a variety of sandy habitats, including partially active sand dunes and stabilized sandhills. A few of the species associated with spiderwort were needle-and-thread grass (*Stipa comata*), northern wheat grass (*Agropyron dasystachyum*), sand grass (*Calamovilfa longifolia*), June grass (*Koeleria macrantha*), Indian rice grass (*Oryzopsis hymenoides*), blue grama grass (*Bouteloua gracilis*), rose (*Rosa* sp.), skeletonweed (*Lygodesmia* sp.) and wild begonia (*Rumex venosus*).

No immediate threats to Alberta's western spiderwort population were evident. Browsing did not appear to inhibit the population, and leafy spurge, which is a concern in other jurisdictions, was not noted during the Alberta inventory. Nonetheless, because Alberta's spiderwort population is currently known only from a 2-km^2 area, local land-use decisions made by only a few leaseholders could have a significant impact on the population.

Recommendations/Future Direction

In 1997, Alberta's *Wildlife Act* was amended to allow designation and recovery of *Threatened* and *Endangered* plants. There is currently no provincial recovery plan in place for western spiderwort. Based on the success of the 2002 inventory, it is recommended that more widespread inventories be conducted in Alberta in at least one more year of high spring moisture, before significant resources and time are put toward a recovery plan. The outlook on the future sustainability of western spiderwort in Alberta will be improved if it is known to occur in more than one site. Other potential areas of sand dune or sandhill habitat in southeastern Alberta include Purple Springs (northeast of the town of Purple Springs), Hilda (northwest of the town of Hilda), Middle Sandhills (within Canadian Forces Base Suffield), and Lazy H (west of the town of Milk River).

After more widespread inventories are complete, a provincial recovery plan should be developed, to set goals, objectives, strategies and actions needed to guide the management of western spiderwort over the next five years. The ESCC has recommended to the Minister of Sustainable Resource Development that initial recovery efforts for this species focus on the identification and conservation of the existing population(s), rather than the creation of new populations, since the rest of the North American population appears healthy. Protection of all western spiderwort populations should be implemented. The possibility of applying an appropriate protective notation should be investigated.

The Scientific Subcommittee of the ESCC has identified areas of research that would help to clarify some aspects of spiderwort biology that are relevant to its status in Alberta and the development of long-term management strategies. These areas of research include genetics (how genetically distinct is Alberta's disjunct population?); seed bank (what is its role in maintaining this species as the population size fluctuates with moisture?); and dune stabilization (is dune stabilization through a lack of disturbance a threat to the persistence of spiderwort?). Alberta biologists will need to coordinate and consult with other jurisdictions regarding their management strategies for western spiderwort.

COOPERATING AGENCIES

Alberta Conservation Association, Alberta Natural Heritage Information Centre, Government of Canada Habitat Stewardship Program

western spiderwort

For more information contact:

Joel Nicholson (*see page 7*) and see Species At Risk Report No. 61, Inventory of western spiderwort (*Tradescantia occidentalis*) in Alberta: 2002.

The report and the 2003 addendum are available at: http://www3.gov.ab.ca/srd/fw/riskspecies/reports.html.

INVENTORY OF COSEWIC-LISTED VASCULAR PLANTS IN ALBERTA, 2002

Project Supervisors: **Robin Gutsell, Sue Peters** (ACA)

REGION:
Provincial (conducted in Southeast)

TARGET SPECIES:
Small-flowered Sand-verbena (*Tripterocalyx micranthus*), Slender Mouse-ear-cress (*Halimolobos virgata*)

***WILDLIFE ACT* CATEGORY:**
None

PROVINCIAL GENERAL STATUS:
May Be At Risk

purpose

To conduct a provincial inventory of two high priority vascular plants that are listed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC)—small-flowered sand-verbena and slender mouse-ear-cress.

Background

Species that have been listed by COSEWIC as *Endangered* or *Threatened* are priorities for evaluation of their status in Alberta. Small-flowered sand-verbena was listed by COSEWIC as *Endangered* in 2002 and slender mouse-ear-cress was listed as *Threatened* in 2000 (COSEWIC 2003). Therefore, a provincial inventory for each of these two species was initiated in 2002, to assist in determining their status in Alberta.

Methods

All previously recorded populations were visited, and new locations were searched for in suitable habitat. Inventories were performed in June (slender mouse-ear-cress), and from July to September (small-flowered sand-verbena) of 2002. The number of individuals and area of coverage were documented for each population observed. Photographs were taken of the target species and of their habitat, and all observations were submitted for entry into the database of the Alberta Natural Heritage Information Centre. Additional information from other surveys conducted in Canadian Forces Base (CFB) Suffield is also included here (from G. Trottier, Canadian Wildlife Service).

Results

Surveys for small-flowered sand-verbena resulted in the largest counts of individuals ever recorded in the province. Plants were found at three of the six previously known sites (Lower Bow, Purple Springs and Grassy Lake), and at one new site at CFB Suffield north of Medicine Hat. Three other known sites were searched in 2002 (Lost River, Wolf Island and Suffield National Wildlife Area), but no plants were found. The habitat at Wolf Island appears to have changed such that it would likely no longer be able to support the species. The surveyor had difficulty ascertaining the exact location of the Lost River site. The Alberta total in 2002, including CFB Suffield, was approximately 3100 plants. Similar surveys that were conducted in most of these sites in 2001 resulted in only a single plant being found.

Searches for slender mouse-ear-cress, on the other hand, yielded no plants in any of the six known locations surveyed along the South Saskatchewan and Red Deer rivers (north of McNeill, Highway 41 crossing of South Saskatchewan River, west side of South Saskatchewan River, northeastern portion of CFB Suffield's north boundary, Police Point at Medicine Hat, and Duchess Community Pasture). Three other previously reported locations were not sampled in 2002 (Sucker Creek at Cypress Hills, central zone of CFB Suffield's north boundary, and Linstead Flats in CFB Suffield). Additional potential locations were surveyed, but no new populations were found. The weather conditions in the survey area were too dry in 2002 for fresh plants to emerge, and stems from the previous year were not evident either.

Recommendations/Future Direction

Sufficient information is now available on small-flowered sand-verbena to compile a report on the detailed status of this species in Alberta. Completion of this status report is expected in May 2003. Once the status report is complete, the Endangered Species Conservation Committee (ESCC) and its Scientific Subcommittee (SSC) will be able to evaluate the species' provincial status. Continued monitoring and searching for any additional unknown populations that may exist will likely be necessary in the future. It will also be valuable to track the species' response to variation in moisture levels. Details of appropriate monitoring should be laid out in a recovery plan, if developed. Potential threats from stabilization of the sand dunes on which this species appears dependent, sand removal (the latter appears to be occurring at the Lower Bow and Grassy Lake sites), and invasive weedy species (especially at the Lower Bow site) should be monitored.

Further surveys for the slender mouse-ear-cress should be undertaken in years when moisture levels in spring or in the previous autumn are sufficient to encourage seeds in the seed bank to germinate and produce flowering and fruiting plants. There is very little information on the ecology of this species, and research is recommended into the relationship between climate, seasonal rainfall, community associates and the development of the species' inflorescence. A preliminary draft of a detailed status report has been initiated, and once population data are available from at least one more year with greater moisture levels than 2002, the report can be completed, and the provincial status of this species should be evaluated by the ESCC/SSC.

COOPERATING AGENCIES

Alberta Conservation Association, Alberta Natural Heritage Information Centre, Canadian Wildlife Service

For more information contact:

Robin Gutsell (*see page 7*).

INVENTORY OF MAY BE AT RISK FERNS IN ALBERTA, 2002

Project Supervisors: **Robin Gutsell, Sue Peters** (ACA)

REGION:
Provincial (conducted in Southeast, Southwest)

TARGET SPECIES:
Paradoxical Grape Fern (*Botrychium paradoxum*), Stalked Moonwort (*Botrychium pedunculosum*)

***WILDLIFE ACT* CATEGORY:**
None

PROVINCIAL GENERAL STATUS:
May Be At Risk

COOPERATING AGENCIES

Alberta Conservation Association, Alberta Natural Heritage Information Centre, Alberta Sport, Recreation, Parks and Wildlife Foundation

For more information contact:

Robin Gutsell (*see page 7*)

purpose

To inventory the provincial distribution of two high priority *May Be At Risk* vascular plants—paradoxical grape fern and stalked moonwort.

Background

Two Alberta fern species were determined to be of high priority for data collection, based on their provincial and global rarity, and potential threats to their populations and habitat. Therefore, a provincial inventory of paradoxical grape fern and stalked moonwort was commissioned, to assist in determining the status of these species in Alberta.

Methods

All previously documented populations were surveyed in July 2002, and described in terms of number of individuals and area of coverage. Slope, aspect, moisture conditions and associated vegetation data were also gathered, and photographs were taken of the target species and of their habitat. All data were submitted to the Alberta Natural Heritage Information Centre.

Results

Locations in Cypress Hills Interprovincial Park, Waterton Lakes National Park, South Drywood Creek, Spionkop Creek and Drywood Creek were searched. Before this survey, paradoxical grape fern was known from only two locations within Alberta, both in Waterton Lakes National Park. The species was found in one of these locations in 2002, but no plants have been found in the second location since 1983. A new location for paradoxical grape fern in Cypress Hills was found in 2002. In total, 24 paradoxical grape fern plants were recorded in two locations in 2002.

Before this survey, there was only one record of stalked moonwort in Alberta, from 1981 in Waterton Lakes National Park. This species had not been found in Alberta since the original collection, until the discovery of a new population of 11 plants found in 2002 in one location in Cypress Hills Interprovincial Park. Also of interest was the first recorded population of straight-leaf moonwort (*Botrychium lineare*) from western Canada—the only known living population within the country. Only two plants were found in 2002, in one location in Drywood Creek.

It is important to recognize that the low numbers reported here reflect a measure of only the number of plants that were visible at the time and do not include below-ground structures for these species.

Recommendations/Future Direction

There are two potential threats to populations of these rare ferns within Alberta: cattle grazing and natural infilling of montane grasslands by trees. The underground life history of *Botrychium* species enables them to coexist with moderate grazing pressure and fire. In fact, small areas of soil turned by animal hooves may create new substrate for colonization. However, repeated, high-intensity grazing or the development of native grasslands by tilling and seeding would pose a threat to *Botrychium* populations, and should be avoided.

The habitat of one subpopulation of paradoxical grape fern in Waterton Lakes National Park is potentially threatened by the encroachment of trees. As it is not a forest-dwelling species, this subpopulation of paradoxical grape fern will perish if the meadow becomes a forest over time. Infilling is a gradual process, so documenting the rate of tree encroachment is recommended as a positive measure to assess the urgency of the threat. Prescribed burning is one management tool that might be considered for this site, although the proximity to heavily used trails may make this approach inappropriate.

BULLSNAKES IN ALBERTA—LITERATURE REVIEW AND DATA COMPILATION

Project Supervisors: **Joel Nicholson, Kelley Kissner**

purpose

To collect and compile available information on bullsnakes in Alberta as background for future status assessments of this species and for researchers intending to study bullsnakes within Alberta.

REGION:
Provincial (conducted in Southeast)

TARGET SPECIES:
Bullsnake (*Pituophis catenifer*)

***WILDLIFE ACT* CATEGORY:**
Non-licence Animal

PROVINCIAL GENERAL STATUS:
Sensitive

Background

In Canada, the bullsnake (*Pituophis catenifer*) occurs only in southern Alberta and Saskatchewan. No comprehensive study of bullsnakes has been conducted in either province. Owing to the lack of information on bullsnake populations in Canada, the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) has designated this species as *Data Deficient* (COSEWIC 2003). In Alberta, the bullsnake is designated as a *Sensitive* species owing to concerns that it may be at risk of decline. Anecdotal evidence suggests that fewer bullsnakes have been observed in recent years. However, baseline data are needed before trends in bullsnake populations can be examined. Increasing pressure on native habitat used by bullsnakes suggests that a decline in bullsnakes in Alberta is probable, particularly combined with recent evidence from populations of *Pituophis catenifer* in British Columbia that indicates that this species is sensitive to habitat loss. There is also evidence that the prairie rattlesnake (*Crotalus viridis*), a species with similar habitat requirements, has declined in Alberta. Much of the recent information that is available on bullsnakes in Alberta has been collected incidentally by researchers studying rattlesnakes or by biologists and individuals interested in this species.

Methods

Data on locations of snakes and natural history information were compiled from provincial databases, museum records, den monitoring projects, researchers, naturalists, casual observation, enforcement occurrence records, and records in the literature.

Results

A range map was compiled from various sources. Records from the Trochu area represent the northernmost limits of this species' range in North America. Unconfirmed reports as far west as Brocket along the Old Man drainage extend the southwestern limit of this species' range in Alberta.

The main features of the natural history of bullsnakes were determined using information collected from the literature and data collected from biologists and naturalists. Briefly, bullsnakes occur in short and mixed grass prairie and are common in brushy and sandy areas, around badlands and rocky outcrops, and also may be found in farmland and fields. Bullsnakes are adept climbers and are regularly observed in trees along river valleys. Bullsnakes spend the winter months in hibernacula that are typically located along the breaks and coulees of the South Saskatchewan, Red Deer, Bow, Oldman and Milk rivers. In Alberta, bullsnakes emerge from hibernation between late April and mid-June and enter hibernation in late August to mid-October. Bullsnakes mate in May, often near hibernacula. After mating, females move to nesting sites in early June and generally lay between 2 and 24 eggs. Females do not incubate their eggs, and they leave nest sites shortly after eggs are laid. In Alberta, neonatal snakes hatch from eggs from mid-August to mid-September. After mating or laying eggs, bullsnakes migrate to areas of high prey abundance and remain there until they return to hibernacula in late August to early October. Bullsnakes will consume a variety of prey types including small mammals, birds, bird eggs, arthropods and other reptiles. Bullsnakes forage by actively searching for prey and kill their prey by constriction. When confronted by a potential predator, a bullsnake will flatten and triangulate its head and will vibrate the tip of its tail. When the tail is vibrated in dry vegetation, it produces a sound similar to a rattlesnake's rattle. In addition to this display, bullsnakes often hiss loudly and may strike if alarmed. Although bullsnakes lack venom, their bite can be painful.

Should bullsnakes ever be designated *At Risk* within Alberta, recovery efforts will be hampered by the biology of this species. Bullsnake females mature at two or three years of age, may produce young only once every two years, and have small litters resulting in low recruitment into populations. Consequently, determining preventative strategies to maintain or increase populations of this species within Alberta is preferable to implementing recovery strategies after a decline.

Recommendations/Future Direction

The following recommendations are suggested to help conserve populations of bullsnakes at the provincial and national level:

- *Provide additional protection under the* Wildlife Act. Reclassification of this species from a non-licence species to a non-game species should be considered because of the perceived decline of this species and high levels of road mortality. In addition, year-round protection of bullsnake hibernacula, rather than protection only from 1 September to 30 April, would remove the threat of destruction of these sites when snakes are not in hibernation.
- *Collect baseline data on population parameters of bullsnakes.* Baseline data on parameters (e.g., size) of bullsnake populations is required to establish whether populations are in decline. Baseline data on population parameters will also contribute to future status assessments of this species, particularly at the national level.
- *Investigate habitat use and requirements of bullsnakes.* Little information is available on the specific habitat requirements of this species across its range. Sampling techniques such as radio telemetry can be used to follow individuals throughout the active season to determine what habitats bullsnakes use, how much time individuals spend in particular habitats, and what activities are carried out in these habitats.
- *Investigate effects of road mortality on snakes.* The available evidence for snakes suggests that road mortality is a significant factor influencing snake populations. Systematic studies to investigate the timing, location and number of mortalities may be used to inform mitigation strategies (e.g., "snake crossing" signs) to decrease the number of snakes killed on roads.
- *Educate the public.* Snakes are typically secretive and cryptic, and thus not easily observed in the wild. Consequently, a general feeling of dislike and fear has been associated with snakes. Efforts to inform the public about the biology and natural history of snakes can increase public appreciation of snakes. In addition, demonstrations of how to identify the various species of snakes in an area and how to deal with or avoid snake encounters should also alleviate some concern. Finally, a discussion of the benefits of snakes (e.g., reduction of rodent pests) should also increase public appreciation of snakes.

COOPERATING AGENCIES

Alberta Conservation Association, Avocet Environmental, AXYS Environmental Consulting, Canadian Museum of Nature, Canadian Wildlife Service, Cottonwood Consultants, Parks Canada, Provincial Museum of Alberta, University of Alberta

For more information contact:

Joel Nicholson (*see page 7*) and see Species at Risk Report No. 62, Bullsnakes (*Pituophis catenifer sayi*) in Alberta: literature review and data compilation.

This report is available at: http://www3.gov.ab.ca/srd/fw/riskspecies/reports.html.

PRAIRIE RATTLESNAKE HIBERNACULA—MONITORING HISTORY 1987-2002

Project Supervisors: **Joel Nicholson, Kelley Kissner**

REGION:
Southeast

TARGET SPECIES:
Prairie Rattlesnake (*Crotalus viridis viridis*)

***WILDLIFE ACT* CATEGORY:**
Non-game Animal
(*ESCC Recommendation: Data Deficient*)

PROVINCIAL GENERAL STATUS:
May Be At Risk

purpose

To summarize the results of surveys conducted at rattlesnake hibernacula between 2000 and 2002 and to summarize data from a variety of reports and from the provincial database on historical numbers of snakes at hibernacula.

Background

The prairie rattlesnake is designated as *May Be At Risk* in Alberta because of an accumulation of anecdotal evidence suggesting that prairie rattlesnake populations have declined in the province in recent years. Hibernation sites (hibernacula) of rattlesnakes are used by a number of individuals for six to eight months per year, making these sites a critical habitat component for this species. In the spring and fall, rattlesnakes typically bask outside hibernacula for a few weeks, which facilitates observation of individuals. In 2000, the Fish and Wildlife Division and the Alberta Conservation Association began a long-term project to monitor prairie rattlesnake hibernaculum use and population numbers. The Fish and Wildlife Division continued this project in 2001 and 2002. The initial project involved reviewing the Biodiversity/Species Observation Database (BSOD) for locations of hibernacula and conducting ground searches in those areas to verify the occurrence of hibernacula.

Interpretation of aerial photos during 2000 and 2001 identified areas that appeared suitable for hibernacula (e.g., slump zones) in order to focus ground searches. In 2002, known hibernacula were monitored and ground searches were conducted in areas that appeared suitable for hibernacula. Prairie rattlesnakes hibernate communally with other snake species, including bullsnakes (*Pituophis catenifer*), garter snakes (*Thamnophis* spp.) and occasionally western hognose snakes (*Heterodon nasicus*), allowing den use by these species to also be monitored opportunistically.

Methods

Surveys of rattlesnake hibernacula were conducted between 2000 and 2002. The maximum number of snakes observed during a single visit was used to index the number of snakes using a particular site. A review of the literature and the provincial database provided data on historical numbers of snakes using some of these sites.

Results

A list of 107 hibernacula was compiled from data from BSOD, surveys, and a review of the literature. Extracting information from BSOD proved challenging mainly because site locations were vague or imprecise, making it difficult to determine how many hibernacula were in a small geographic location. In addition, a variety of names were given for individual hibernacula, making it difficult to determine correspondence among records. Only 70 of the 107 sites were visited between 2000-2002. Forty-three of the hibernacula were active, 18 were potentially active and nine were inactive or had been destroyed. Eight other potential sites were also located. Locations of new hibernacula have been added to the provincial database.

In total, 757 snakes were observed at hibernacula between 2000-2002. Typically, few individuals were observed at each site. The available historical information on rattlesnake numbers at hibernacula indicates that fewer rattlesnakes appear to be using these sites in recent years, suggesting a decline in the prairie rattlesnake population in Alberta. Until more intensive methods for estimating the size of the prairie rattlesnake population in Alberta are implemented (e.g., mark-recapture techniques), these observations and surveys can be used to estimate changes in the prairie rattlesnake population in the province and to inform future status assessments of this species.

Recommendations/Future Direction

Several recommendations have been suggested to help maintain prairie rattlesnake populations:

- *Develop a provincial management plan.* In 2000, the Endangered Species Conservation Committee (ESCC) designated the prairie rattlesnake as *Data Deficient* owing to the lack of detailed information on population size and trends. A provincial management plan for prairie rattlesnakes is currently under development and will include recommendations by the ESCC to allocate resources to collect information on population size, distribution and population trends of rattlesnakes in the province. A reassessment of the status of prairie rattlesnakes by the ESCC will occur by 2005.

- *Monitor population size.* Baseline data on population parameters are needed to determine whether prairie rattlesnakes are declining and to inform future provincial and national status assessments. Counts of snakes at hibernacula provide a coarse method for monitoring rattlesnake numbers in Alberta. However, these counts do not identify individuals, making it impossible to obtain accurate estimates of the number of individuals at a site. More accurate estimates of the size of the prairie rattlesnake population in Alberta will require the use of mark-recapture techniques.
- *Identify denning and birthing habitat.* Hibernacula and rookeries (birthing sites) represent critical habitat components for prairie rattlesnakes. Identification and protection of these areas are critical to the conservation of prairie rattlesnakes in Alberta. Ground searches for hibernacula and rookeries are time-consuming and laborious. Predictive models that identify where these areas should occur on the landscape provide a means of focusing ground searches. Recently, air photo interpretation and Geographic Information System models have been used to identify areas likely to contain hibernacula. Similar models may be useful to identify rookery habitat. Once developed, these methods will require ground-truthing and, potentially, refinement.
- *Determine habitat use by rattlesnakes and the influence of habitat fragmentation on gene flow among denning populations.* Little information is available on the specific habitat requirements of prairie rattlesnakes in Alberta. Studies of habitat use will assist in determining habitats and areas that are particularly critical for the persistence of this species. Land use activities have resulted in the fragmentation of much native habitat for prairie rattlesnakes, leading to smaller and more isolated populations, precluding mating opportunities and restricting gene flow. Studies that examine snake movement and genetic diversity among denning populations are needed to determine how land use activities and habitat fragmentation affect gene flow.
- *Investigate the effect of road mortality on rattlesnake populations.* A large number of snakes are killed on roads as they disperse from dens to upland habitat to forage. Further study using standardized methods is needed to 1) examine timing, location, and number of mortalities and how these interact with traffic intensity and road type; 2) determine the impact that road mortality has on snake populations; and 3) determine appropriate mitigation measures to decrease the level of road mortality (e.g., snake crossing signs).

COOPERATING AGENCIES

Alberta Conservation Association, University of Calgary

For more information contact:

Joel Nicholson *(see page 7).*

LETHBRIDGE PRAIRIE RATTLESNAKE CONSERVATION PROJECT

Project Supervisors: **Richard Quinlan, Randy Lee** (ACA)

REGION:
Southeast

TARGET SPECIES:
Prairie Rattlesnake (*Crotalus viridis viridis*)

***WILDLIFE ACT* CATEGORY:**
Non-game Animal
(*ESCC Recommendation: Data Deficient*)

PROVINCIAL GENERAL STATUS:
May Be At Risk

purpose

To restore the Lethbridge population of the prairie rattlesnake to a sustainable level through public education and by providing secure hibernacula and foraging areas for rattlesnakes in the city.

Background

The coulees of southwest Lethbridge are home to a small population of prairie rattlesnakes. High rates of mortality from road kills, deliberate human persecution and a rapid loss of habitat to subdivision and recreational development make the future of Lethbridge rattlesnakes uncertain.

In the fall of 1999, concerned citizens and staff from the City of Lethbridge determined that a management plan was necessary if the Lethbridge population of rattlesnakes was to be saved from elimination. In 2000, a committee was formed to develop a management plan. Public participation was solicited through an open house. Many Lethbridge residents have expressed a strong desire to conserve and enhance the remaining population of prairie rattlesnakes. Efforts in 2001 focused on establishing a new rattlesnake population in Cottonwood Park, where the species' long-term survival seemed most likely. Cottonwood Park offers many advantages, including its location away from residential and recreational areas, its designation as a nature reserve, its lack of road access and its favourable habitat features. The program continued in 2002, with a focus on public education and conservation efforts.

Methods

Public education was promoted through the use of interpretive signs, educational brochures, hibernaculum tours, media interviews and information from the summer Park Ranger. Drift fences and traps were strategically placed to discourage rattlesnakes from entering areas where they would create problems. Calls for snake removals and investigations were responded to promptly. Problem and vulnerable rattlesnakes were captured and relocated to the Cottonwood Park hibernaculum and forced to overwinter there by confining them to an enclosure surrounding the den entrance. A chain link fence with a locked gate was installed around the newly constructed Cottonwood Park hibernaculum to discourage vandalism. Rattlesnakes in the hibernaculum were fed ground squirrel and mouse carcasses throughout the spring and summer, usually at weekly intervals.

Snakes were captured using snake tongs and traps, and restrained using a portable restraining noose. They were implanted with passive integrated transponder (PIT) tags for long-term identification, and some were also equipped with external radio transmitters used to monitor their movements and habitat use upon being released. Radio transmitters were attached to the rattles using five-minute epoxy and tape. Female rattlesnakes were palpated to determine reproductive status. A veterinarian supervised all work. Following the release of transmitter-fitted rattlesnakes, radio telemetry was used to track dispersal from the Cottonwood Park hibernaculum (release site) and subsequent habitat use.

During construction of the Cottonwood Park facilities, temperature probes were installed in both winter chambers, and temperatures were monitored and recorded throughout the winter and spring of 2002. The data were then used to determine whether the winter chambers provided temperatures within the range tolerated by hibernating rattlesnakes, as well as to evaluate the relationship between warming spring temperatures, den temperatures and spring emergence.

Results

Public Education

Interpretive signs were installed in Popson and Cottonwood parks. Rattlesnake brochures were distributed in adjacent West Lethbridge neighbourhoods, and were available year-round through various outlets in Lethbridge including the public library and the Fish and Wildlife Division office. Nine tours to the Cottonwood Park hibernaculum facilities were conducted through the Helen Schuler Coulee Centre. Hibernaculum tours were also given to Environmental Science students from the Lethbridge Community College and to students enrolled in a field course from the University of Lethbridge. Requests for information were addressed, and media interviews were granted upon request.

Reduction of Human/Snake Conflicts

In May of 2002, drift fences and traps were positioned between the main Popson Park hibernaculum and the Paradise Canyon area

in order to capture rattlesnakes before they became problematic or vulnerable. Requests from citizens were responded to by relocating snakes to the new hibernaculum. In total, 15 reports of rattlesnake activity were investigated, including 10 reports involving snake removals and four reports of rattlesnake mortality. Compared to 2001, when there were 10 rattlesnake removals from the Paradise Canyon area, there were only six rattlesnake removals in 2002. Within Lethbridge, five snakes were reported killed in 2002 versus nine in 2001, and only one deliberate killing was reported in 2002 versus three in 2001.

Maintaining Rattlesnakes at the Cottonwood Park Hibernaculum

Both adult and neonate rattlesnakes fed regularly. Young mouse carcasses were fed to five neonates born in 2001. One mouse carcass was provided for each rattlesnake, and if all carcasses were consumed promptly, a fresh supply of carcasses was provided. Water was available as required. Competition for food was not evident and food remained uneaten after September 15. Because digestion of food in ectotherms is temperature dependent, rattlesnakes probably stop feeding in mid-autumn to avoid going into hibernation with undigested food in their systems.

Reproduction

In 2002, no neonates were observed until around mid-October. A gravid female at the Cottonwood Park hibernaculum passed six unfertilized eggs before giving birth to nine neonates.

Provision of Secure Habitat in Cottonwood Park

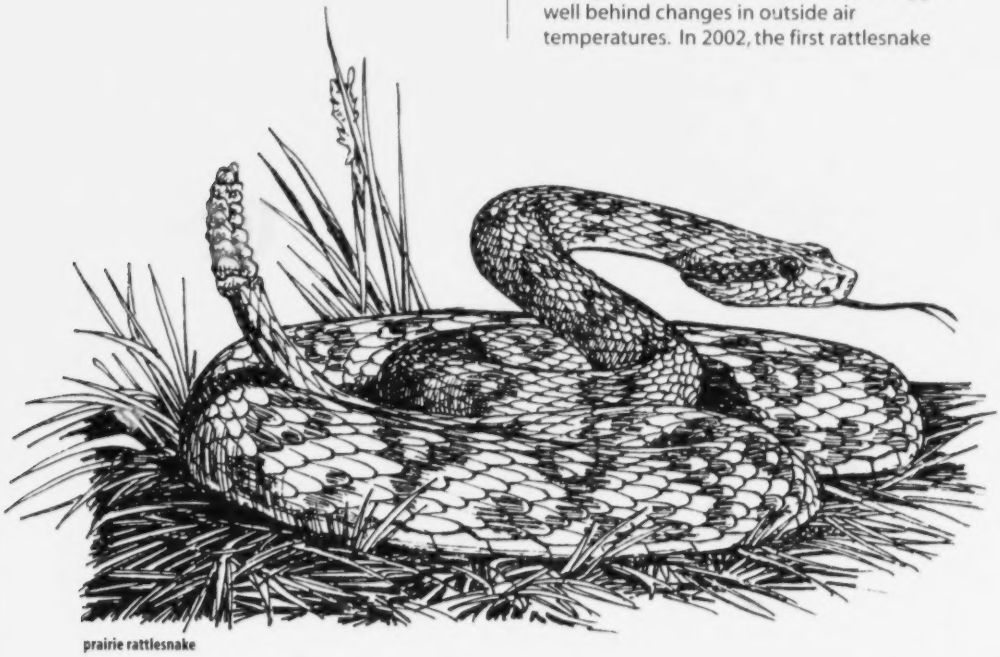
In 2002, the City of Lethbridge purchased the property adjoining Cottonwood Park. This acquisition effectively doubled the size of the nature reserve and provided increased security for rattlesnakes.

Marking and Radio Telemetry

Nine adults that had overwintered at the Cottonwood Park hibernaculum were recaptured during the spring of 2002 and implanted with PIT tags; eight of them were also fitted with external radio transmitters. The eight transmitter-equipped snakes were subsequently released from the enclosure (six in late May, two in mid-June), and their movements were tracked, using radio telemetry, through midsummer 2002. Six snakes captured during the spring of 2002 were implanted with PIT tags in May, and an additional nine rattlesnakes captured over the summer were implanted with PIT tags in September. All 15 snakes were released in the hibernaculum enclosure for overwintering. As a result of design and technical problems, the effectiveness of externally attached transmitters for radio tracking rattlesnakes was poor. Telemetry work will be continued in 2003 with redesigned transmitters.

Den Temperatures, Overwintering Success and Spring Emergence

Temperature probes within the two winter chambers at the hibernaculum allowed for monitoring of interior temperatures. Changes in interior den temperatures lagged well behind changes in outside air temperatures. In 2002, the first rattlesnake



prairie rattlesnake

emerged on April 11 when the interior temperature was 5.6°C, which was only 0.5°C above the lowest temperature of 5.1°C recorded for that chamber during the winter of 2001-2002. Outside air temperature at the time was 17°C. Several more rattlesnakes emerged the next day (April 12). Studies at naturally occurring hibernacula indicate that overwintering mortality of rattlesnakes can be high, especially for neonates. At the Cottonwood Park hibernaculum, neonates were counted in the fall of 2001 just before hibernation and again in the spring of 2002. It was concluded that most, if not all, of them survived the winter, indicating that the winter den at Cottonwood Park offers suitable refuge from freezing temperatures.

Recommendations/Future Direction

The Lethbridge population of prairie rattlesnakes requires a coordinated effort involving the continuation of public education activities initiated in 2001 and a close monitoring, control and maintenance system if the population is to recover to a sustainable level.

To better monitor the population, redesigned transmitters need to be attached to adult rattlesnakes at the Cottonwood Park hibernaculum prior to release in the spring of 2003. Using radio telemetry and other methods, rattlesnake movements and activities can be tracked during the summer of 2003. The effectiveness of the redesigned transmitters can be evaluated. The activities of rattlesnakes on private lands adjoining Cottonwood Park must be monitored. In the case that landowners do experience problems associated with current conservation efforts, mitigation measures (fencing and monitored traps) must be implemented. Other monitoring efforts consist of releasing rattlesnakes captured in 2003 equipped with transmitters at the Cottonwood hibernaculum, and monitoring their movements to determine if they try to return to their point of capture, or if they recognize the Cottonwood Park hibernaculum as a suitable place to hibernate (i.e., will they use the Cottonwood Park habitat and return to the Cottonwood Park den to overwinter?).

In efforts to control the population, problem and vulnerable rattlesnakes will continue to be captured, marked, relocated and maintained. Fencing and traps will be installed at the east end of Cottonwood Park to intercept migrating rattlesnakes when necessary. Any captured rattlesnakes will be released (not contained) near the Cottonwood Park hibernaculum. Traps will be installed around the outside of the Cottonwood Park hibernaculum fence to capture returning rattlesnakes in the fall of 2003. Fencing and traps will also be installed near the Popson Park hibernaculum to intercept rattlesnakes migrating north toward developed areas of Paradise Canyon. These rattlesnakes would be considered problematic or vulnerable and should be maintained at the Cottonwood Park hibernaculum during 2003, to be released in spring 2004. During the fall of 2003, a sweep of Cottonwood Park and the surrounding area should be conducted to search for and capture marked rattlesnakes for release back at the Cottonwood Park hibernaculum.

Several conservation strategies can be used to maintain the existing population of rattlesnakes:

- Contain and feed neonates born at the Cottonwood Park facilities and release them when they are juveniles. This will greatly increase their chances of survival, and therefore increase their chance of becoming part of the Cottonwood Park population.
- Allow the existing population of rattlesnakes to remain in Popson Park unless development or other factors make it no longer practical to do so.
- Establish a rattlesnake sanctuary in Cottonwood Park that would also provide an area to relocate problem snakes from other parts of the city.
- Construct and install signs on formal trails in Cottonwood Park advising users to stay on developed trails during the spring, summer and fall to help prevent surprise encounters between humans and rattlesnakes.
- Maintain ground squirrel colonies on sites away from trails to reduce human/snake conflicts associated with rattlesnakes travelling in search of prey.

COOPERATING AGENCIES

Alberta Conservation Association, City of Lethbridge, Lethbridge Naturalists Society, Paradise Canyon Resort, Runner's Soul

For more information contact:

Richard Quinlan *(see page 7)* and see Species at Risk Report No. 64, Lethbridge prairie rattlesnake conservation project: 2002-2003 progress report.

This report is available at: http://www3.gov.ab.ca/srd/fw/riskspecies/reports.html.

SHORT-HORNED LIZARD POPULATIONS IN ALBERTA – 2002 SURVEY

Project Supervisor: **Joel Nicholson**

REGION:
Provincial (conducted in Southeast)

TARGET SPECIES:
Short-horned Lizard
(*Phrynosoma hernandesi*)

***WILDLIFE ACT* CATEGORY:**
Non-game Animal

PROVINCIAL GENERAL STATUS:
May Be At Risk

COOPERATING AGENCIES

Local landowners and leaseholders

For more information contact:

Joel Nicholson (*see page 7*) and see Species at Risk Report No. 65, Short-horned lizard (*Phrynosoma hernandesi hernandesi*) populations in Alberta – 2002 survey results.

This report is available at: http://www3.gov.ab.ca/srd/fw/riskspecies/reports.html.

purpose

To conduct surveys of historical areas not completed in the 2001 survey, and to determine the distribution and population trends of short-horned lizard populations in southern Alberta.

Background

Occurring in Alberta at the northern periphery of its North American range, the short-horned lizard is the only native lizard species found in the province. Never found in abundance, this small well-camouflaged lizard typically occurs in low-density populations. The species is classified as *May Be At Risk* in Alberta owing to the small number of disjunct populations and the threats to habitat from irrigation development and industrial activity. Detailed status assessment by the Endangered Species Conservation Committee is planned for the near future.

Within Alberta, short-horned lizards occur in the Dry Mixedgrass Natural Subregion and tend to inhabit localized areas with thinly vegetated slopes and southern aspects that are located along rivers and other major topographic features. Populations have been recorded in areas near Medicine Hat, Bow Island, Manyberries and Foremost.

The last major effort to determine the range and assess the general population status of short-horned lizards in Alberta was conducted in 1991. In 2001, an inventory program was initiated to gather information on current distribution. Owing to the large number of sites scheduled to be surveyed, work could not be finished in 2001. The 2002 survey aimed to finish off the lower priority sites that could not be completed in 2001.

Methods

The survey method was consistent with the 2001 survey. Searches were conducted in areas of previously recorded observations, during late July and mid-August. The surveys were timed to immediately follow the parturition period (when females give birth) in order to coincide with the highest lizard population of the year.

Captured animals were marked with a non-toxic felt-tipped pen to avoid re-counting the same individuals. Information collected included location, sex, age, weight, snout-vent length, local vegetation characteristics, a description of the surrounding vegetation, slope and aspect of the capture site, general weather conditions, and estimates of daily high and low temperatures on search days. The time spent searching was also recorded. Photos were taken of most locations to provide a visual record of sites, regardless of whether lizards were captured or not. All capture data were entered into the Biodiversity/Species Observation Database.

Results

Unusually cool summer temperatures and rainy weather within the late July – early August search window significantly hampered the search effort in 2002. Lizards are not active when daytime temperatures are low, making surveying impossible. Owing to the unusual weather, only a small number of sites could be completed.

Eight sites, comprising 15 separate sections of land were searched, either completely or in part. Only five lizards were captured during seven days of searching, all at one site. At the site where lizards were captured, a total search time of six hours and 22 minutes per capture was documented. This was more than twice the average search time of the previous year.

Surveys in 2002 increased the total number of searches to 59 sections. Lizards were documented at only 19 of these 59 sections. Although the lizard population is very difficult to gauge, the data seem to suggest a range contraction for this species.

Recommendations/Future Direction

Short-horned lizard populations inventoried in 2001 and 2002 seem generally stable, when compared with the results of previous search efforts, although lizards were not observed at some previously occupied sites. Surveys should continue in 2003 and beyond, targeting any historical locations that were not searched during 2001 or 2002, as well as concentrating on suitable sites that have not been previously surveyed.

Given that the majority of high priority sites have now been surveyed, the population size could be monitored on a much smaller scale, with selected locations receiving brief annual surveys. Such surveys could provide long-term information that would aid in obtaining a reasonable evaluation of population trends and therefore a more accurate status assessment for this species in the province. Long-term site-specific monitoring could be augmented with once-per-decade site checks at outlying, less densely populated sites.

Other management options include pre-development surveys to determine the occurrence of this species, and implementation of suitable mitigation strategies to minimize negative effects of industrial activity in lizard habitat. Avoidance of vehicular traffic or any other significant disturbance on south-facing slopes and areas adjacent to such appropriate habitat, especially in regions potentially inhabited by lizards, is prudent.

THE STATUS OF ALBERTA WILDLIFE – DETAILED STATUS REPORTS

Project Supervisors: **Sue Peters** (ACA), **Robin Gutsell**

REGION:
Provincial

TARGET SPECIES:
At Risk/May Be At Risk/ Undetermined species

***WILDLIFE ACT* CATEGORY:**
Varied

PROVINCIAL GENERAL STATUS:
Varied

purpose

To initiate new detailed status reports, and to post recently published reports on Sustainable Resource Development's Fish and Wildlife Division web site.

Background

Every five years, the Fish and Wildlife Division reviews the status of wild species in Alberta. These assessments, which were conducted in 1991, 1996 and 2000, assign to individual species general status ranks that reflect the perceived level of risk to populations that occur in the province.

The Alberta Wildlife Status Report series builds on the general status exercise (*The Status of Alberta Wildlife* [Alberta Environmental Protection 1996], *The General Status of Alberta Wild Species 2000* [Alberta Sustainable Resource Development 2001]), and provides comprehensive summaries of the biological status of selected wildlife species in Alberta.

These detailed status reports profile all current, relevant and available information for a species in a single document. The reports provide important information to the Endangered Species Conservation Committee and are an invaluable tool for Fish and Wildlife Division staff. Information contained within these reports has not only aided management decisions, but has raised public awareness of the current status of Alberta's wildlife species. As of March 2003, a total of 48 detailed status reports had been published, including one 2003 update of an earlier report.

Methods

Qualified individuals were contracted to prepare the new reports. Before being printed, each report went through an extensive review process, including species experts from outside the Fish and Wildlife Division. In addition, the data sets that resulted from each report were entered into the Biodiversity/Species Observation Database or the Alberta Natural Heritage Information Centre database.

Results

Six new reports were initiated in 2002-2003: western silvery minnow (*Hybognathus argyritis*), stonecat (*Noturus flavus*), St. Mary shorthead sculpin (*Cottus confusus*), mountain plover (*Charadrius montanus*), small-flowered sand-verbena (*Tripterocalyx micranthus*), and slender mouse-ear-cress (*Halimolobos virgata*). As well, one update report was initiated (northern leopard frog [*Rana pipiens*]).

Of the reports initiated in 2002-2003, four status reports have been printed, and final drafts of the remaining three reports have been submitted to the editor. The slender mouse-ear-cress report is considered preliminary, until current population information can be collected and added to the report.

Three reports initiated in the previous fiscal year were printed in 2002-2003: American badger (*Taxidea taxus*), white-winged scoter (*Melanitta fusca deglandi*) and lake sturgeon (*Acipenser fulvescens*). Another report initiated in the previous fiscal year (brown creeper [*Certhia americana*]) was printed in June 2003.

Recommendations/Future Direction

The following species are priorities for detailed status reports planned for 2003-2004:

- Sage thrasher (*Oreoscoptes montanus*)
- Arctic grayling (*Thymallus arcticus*)
- Short-horned lizard update (*Phrynosoma hernandesi*)
- Barred owl (*Strix varia*)
- Tiny cryptanthe (*Cryptantha minima*)

As well, the slender mouse-ear-cress report (commissioned in 2002-2003) will be completed, if new population data can be collected in the summer of 2003.

COOPERATING AGENCIES

Alberta Conservation Association

For more information contact:

Robin Gutsell (*see page 7*) or **Sue Peters** (Sue.Peters@gov.ab.ca).

For copies of the reports, contact: Information Centre 780.422.2079 or visit http://www3.gov.ab.ca/srd/fw/status/reports/index.html.

HABITAT STEWARDSHIP PROGRAM FOR SPECIES AT RISK IN SPECIAL AREAS 2, 3 AND 4 OF SOUTHEASTERN ALBERTA

Project Supervisor: **Arlen Todd**
Project Employee: **Corey Skiftun**

REGION:
Southeast

TARGET SPECIES:
Baird's Sparrow (*Ammodramus bairdii*), Burrowing Owl (*Athene cunicularia*), Ferruginous Hawk (*Buteo regalis*), Loggerhead Shrike (*Lanius ludovicianus*), Long-billed Curlew (*Numenius americanus*), Long-tailed Weasel (*Mustela frenata*), Northern Leopard Frog (*Rana pipiens*), Ord's Kangaroo Rat (*Dipodomys ordii*), Plains Spadefoot (*Spea bombifrons*), Piping Plover (*Charadrius melodus*), Short-eared Owl (*Asio flammeus*), Sprague's Pipit (*Anthus spragueii*), Upland Sandpiper (*Bartramia longicauda*)

***WILDLIFE ACT* CATEGORY:**
Endangered: Ord's Kangaroo Rat, Piping Plover
Threatened: Burrowing Owl, Ferruginous Hawk, Northern Leopard Frog
Non-game Animals: Baird's Sparrow, Loggerhead Shrike, Long-billed Curlew, Plains Spadefoot, Sprague's Pipit, Upland Sandpiper
Bird of Prey: Short-eared Owl
Fur-bearing Animal: Long-tailed Weasel
(*ESCC Recommendation—Special Concern: Loggerhead Shrike, Long-billed Curlew, Sprague's Pipit*)

PROVINCIAL GENERAL STATUS:
At Risk: Burrowing Owl, Ferruginous Hawk, Northern Leopard Frog, Piping Plover
May Be At Risk: Long-billed Curlew, Long-tailed Weasel, Ord's Kangaroo Rat, Plains Spadefoot, Short-eared Owl
Sensitive: Baird's Sparrow, Loggerhead Shrike, Sprague's Pipit, Upland Sandpiper

COOPERATING AGENCIES
Alberta Conservation Association, Avocet Environmental, Government of Canada Habitat Stewardship Program, Special Areas Board

For more information contact:
Arlen Todd (*see page 7*) or **Corey Skiftun** (Corey.Skiftun@gov.ab.ca).

purpose

To identify priority areas of native prairie and initiate habitat stewardship actions for species at risk in Special Areas 2, 3 and 4.

Background

Significant blocks of native prairie still remain in the Special Areas, at the scale of one to several townships in size. These blocks of native prairie are situated in a regional landscape where significant fragmentation of native prairie has occurred, resulting in declines in species such as the ferruginous hawk and burrowing owl. Areas of remaining suitable habitat may become vitally important for a variety of at-risk and sensitive species such as the ones featured here. Also, many other relatively rare grassland species occur in the project area, and stewardship actions may help to prevent them from becoming at risk.

Methods

Information was collected from databases such as the Biodiversity/Species Observation Database (BSOD) and from native vegetation studies, breeding bird surveys and other sources. This information was considered in conjunction with examination of aerial photos and field reconnaissance to complete a township-by-township landscape assessment, which identified priority areas for stewardship actions. Landholder contacts will follow in strategically picked priority areas (mostly in year two). Stewardship tools such as range management plans will subsequently be developed and implemented on priority properties.

Results

A township-by-township landscape assessment was completed on all townships either wholly or partly in Special Areas 2, 3 and 4 (total of 234 townships assessed). The assessment identified six townships as high priority, 80 as medium, 125 as low priority, and 23 as very low priority. In general, there was limited information on species at risk occurrences in the Special Areas. To illustrate, 29 townships had no recorded occurrences of the target species in BSOD. Accordingly, seven townships with no species records but a high proportion (76-100%) of native prairie were also identified as secondary priorities for further inventory of species at risk.

Recommendations/Future Direction

Generalized range assessments of specific priority parcels will be developed in year two (2003-2004), and range management plans will be developed for the highest priority parcels. Additional inventory work for species at risk will be carried out both in priority parcels, as well as in townships lacking data for species at risk but with high proportions of native prairie. This is expected to be a multi-year project.

A MULTI-SPECIES CONSERVATION STRATEGY FOR SPECIES AT RISK IN THE MILK RIVER BASIN

Project Supervisors: **Richard Quinlan, Paul Jones** (ACA)
Project Biologist/Technician: **Brad Taylor** (ACA), **Brad Downey** (ACA)

REGION:
Southeast

TARGET SPECIES:
Roughly 40 At Risk, May Be At Risk and Sensitive species

***WILDLIFE ACT* CATEGORY:**
Endangered, Threatened, Non-game Animals

PROVINCIAL GENERAL STATUS:
Varied

purpose To develop a process to manage multiple species at risk within a defined landscape.

Background

The Milk River basin may contain the highest number of species at risk of any definable landscape in Alberta. This, combined with the relatively small size of the drainage basin (6776 km^2), led to this landscape being selected for Alberta's first venture into multi-species management of species at risk.

A number of specific objectives were identified:

- To summarize existing information for species at risk in the Milk River basin.
- To identify data gaps and to design and carry out inventories for those species for which data are lacking.
- To determine, through a species selection process, priority management species for the project.
- To identify habitat associations of selected management species, and describe these through Habitat Suitability Index (HSI) models.
- To produce a map of the drainage basin showing relative habitat suitability for each selected management species.
- To identify portions of the drainage basin that are highly important to individual and multiple species at risk (terrestrial and aquatic).
- To discern the natural landscape processes of importance in the Milk River basin.
- To evaluate range management systems for their relative value in providing habitat for species at risk.
- To develop beneficial management practices for Milk River basin species at risk.
- To provide specific conservation and stewardship recommendations for high priority areas of the Milk River basin.
- To report results of the project to Milk River basin communities and conservation groups with an interest in the Milk River basin.
- To facilitate partnerships to achieve conservation of species at risk through voluntary stewardship actions.

Methods

In April 2002, a scoping phase of the project was carried out to determine occurrences and distribution of species at risk (those with a provincial general status of *At Risk*, *May Be At Risk* or *Sensitive*) within the Milk River basin. This exercise was followed by a review to determine data gaps for both species and portions of the landscape. Wildlife surveys were developed and scheduled. Inventories were completed in the spring and summer of 2002. Results were used to better understand species distribution and habitat associations. A species selection process was developed to identify species for which habitat models would be prepared (project management species). Variables used to describe habitat were based on data available in electronic map databases. This led to creation of maps showing relative habitat values for the project management species throughout the basin.

The fisheries component of the project included completion of a Milk River fish inventory that had been initiated in 2001. In addition to this, a survey of tributaries was started in 2002 to determine areas of particular importance in providing drought refugia for fish and other aquatic species. These fish refugia will be mapped and identified as areas of high habitat value on the landscape.

While the inventory, modeling and mapping initiatives were underway, a review was also being carried out of natural processes on the landscape and current range management systems. A compilation of beneficial management practices for the project management species was initiated. The resultant product increased understanding of species' distribution and habitat associations, and combined with improved knowledge of appropriate management, will allow for conservation and stewardship options to be presented in the second year of the project. These conservation and stewardship options will be developed through partnerships between the project managers, local communities and conservation organizations, and will be based on cooperative voluntary approaches.

Results

Fisheries inventories included continuation of a Milk River fish species at risk survey (western silvery minnow [*Hybognathus argyritis*], St. Mary shorthead sculpin [*Cottus confusus*], stonecat [*Noturus flavus*], sauger [*Stizostedion canadense*]),

and a fish refugium inventory (brassy minnow [*Hybognathus hankinsoni*]). There were also surveys for amphibians (Great Plains toad [*Bufo cognatus*], plains spadefoot [*Spea bombifrons*], northern leopard frog [*Rana pipiens*]), reptiles (prairie rattlesnake [*Crotalus viridis*], bullsnake [*Pituophis catenifer*], painted turtle [*Chrysemys picta*], short-horned lizard [*Phrynosoma hernandesi*]), and birds (aerial survey for raptors, ferruginous hawk [*Buteo regalis*] quadrats, block surveys and road transects for loggerhead shrike [*Lanius ludovicianus*]). Results are summarized in Species at Risk Report No. 72 (*see below for web address*), including range extensions for amphibian and fish species, valuable information on raptor nesting habitat, and critical data on amphibian habitat associations.

Through a species selection process that recognized the importance of habitat structure, ecological tolerances, species assemblages, keystone species, and affiliation with native habitats, a total of 17 project management species was selected. These species include seven birds, five mammals, two reptiles, two amphibians and one invertebrate.

HSI models have been developed for 15 of the 17 project management species, and five of these models are described in Species at Risk Report No. 72. The models' variables are based on digital map databases available for the Milk River basin. Although some variables were not represented in digital map databases (e.g., individual trees for the ferruginous hawk model), use of these databases enabled the production of Geographic Information System maps showing categorized areas of suitability across the Milk River basin. Five of the HSI maps are displayed in Species at Risk Report No. 72.

A summary of beneficial management practices was scheduled for year two of the project; however, resources were attained to initiate a pilot demonstration late in year one. The review was carried out on sharp-tailed grouse (*Tympanuchus phasianellus*), a prairie species listed as *Sensitive* in Alberta. Possible range management systems were demonstrated, and insight was provided into the relative effectiveness of each system for managing sharp-tailed grouse. This pilot project has been expanded to develop beneficial management practices for the burrowing owl (*Athene cunicularia*), and these practices will be completed and circulated for an expert review early in year two.

Year one of the project demonstrated that a multi-species approach to managing species at risk is feasible within a drainage-basin landscape. Year two will concentrate on completion of species inventories, model and map refinement, use of the information for prioritization of the landscape, and initiation of stewardship activities.

Recommendations/Future Direction

1) Fish and Wildlife Division inventories of species at risk for which data are lacking will continue in 2003-2004.
2) Priority areas for conservation and stewardship of species at risk should be identified in 2003-2004. This will be achieved by the following:
   - completion and refinement of habitat suitability models for the 17 project management species;
   - continued search for and compilation of observation records for *At Risk*, *May Be At Risk* and *Sensitive* species;
   - completion of the Milk River drainage basin maps showing potential habitat for each project management species;
   - overlay of maps to determine landscape "hot spots", representing areas of relatively high potential habitat for several species at risk;
   - inclusion of areas already identified as high priority for species of management concern through other projects (e.g., greater sage-grouse [*Centrocercus urophasianus*], western blue flag [*Iris missouriensis*], soapweed [*Yucca glauca*], pronghorn [*Antilocapra americana*]);
   - mapping and inclusion of identified fish refugia as critical habitat for aquatic species.
3) Stewardship implementation will begin in prioritized areas.
4) The reviews and summaries of beneficial management practices will be completed for the remaining 16 project management species and fish refugia.
5) A summary of land use guidelines will be completed for each of the 17 project management species, or for groups of these species, as well as for fish refugia. These summaries will include existing guidelines and, where needed, recommendations for additional land use guidelines to protect Milk River basin species that are at risk from direct and secondary impacts of various land use developments (e.g., roads, oil and gas wells, pipelines, water diversions).
6) A general land use guideline reflecting the importance of ephemeral wetlands to plains spadefoot and Great Plains toad will be prepared. It will recommend avoidance of excavation activities on or adjacent to ephemeral wetlands. In the Milk River basin, these wetlands are dry and difficult to identify during most years, but they represent a dormant habitat of high biodiversity and a priority area for species at risk management on the prairie landscape.

COOPERATING AGENCIES

Alberta Conservation Association, Alberta Sustainable Resource Development—Lethbridge Resource Information Unit, Government of Canada Habitat Stewardship Program

For more information contact:

Richard Quinlan (*see page 7*) and see Species at Risk Report No. 72, A multi-species conservation strategy for species at risk in the Milk River basin: year 1 progress report.

This report is available at: http://www3.gov.ab.ca/srd/fw/riskspecies/reports.html.

SPECIES OF SPECIAL CONCERN CONSERVATION MANAGEMENT PLANNING

Targeted management and monitoring may be required for some species that are not *Endangered* or *Threatened*, but which have characteristics that may make them particularly sensitive to human activities or natural events. These species can be recommended as *Species of Special Concern* by the Endangered Species Conservation Committee (ESCC), following detailed status evaluation by the Scientific Subcommittee.

Conservation management plans for species recommended as *Species of Special Concern* in Alberta must be developed within five years of approval of the status recommendation by the provincial Minister of Sustainable Resource Development. Depending on the circumstances unique to each species, a shorter timeline can be suggested by the ESCC for approval by the Minister. These management plans are Fish and Wildlife Division (FWD) documents designed to provide guidance for species management.

Draft plans are prepared by FWD personnel, circulated for technical and peer review (by species experts, other provincial government departments and FWD staff), and, where appropriate, distributed to stakeholders for review. The final draft plan is submitted to the Director of Wildlife Management, for review and approval. The plan will also be presented to the ESCC for information. Upon approval by the Director, plans will be made available to partners, the public and other relevant agencies, and will be posted on the departmental web site.

Management plans are dynamic documents that will be amended as conditions require. They will be subject to a brief annual review by FWD personnel and updated accordingly. Updates will be included in the annual Species at Risk Program and Projects report and an in-depth review will occur within five years of the plan's inception.

Management plans will include a brief background section, outlining the rationale for the species listing, threats to populations and habitat, breeding biology, and research and inventory/monitoring history. A goal(s) and objectives are identified as per the recovery planning process and can encompass the following: inventory, monitoring and research needs; habitat requirements and conservation; management activities; and other considerations, such as public education initiatives. There will be considerable variation in the nature and specificity of objectives, depending on the species and current state of knowledge regarding population size, trends and habitat use. Specific population targets and/or location-specific inventory and management recommendations may be appropriate for some species; however, for most species, targets and recommendations will be general in nature.

Actions and recommendations for management will be clearly outlined, have a direct impact on species' populations and/or habitat, and be easy to implement. Recommendations will be species-specific and based on current knowledge and the need to fill particular information gaps, and will address relevant land-use activities, if applicable. Management plans are not intended to advocate changes to policies or guidelines regarding land-use activities; however, they may profile how current guidelines may be affecting the species or its habitat.

LONG-TOED SALAMANDER CONSERVATION MANAGEMENT PLAN

Staff Lead: **Lisa Wilkinson**

Background

In March 2000, the Endangered Species Conservation Committee recommended that the long-toed salamander (*Ambystoma macrodactylum*) be listed as a *Species of Special Concern* in Alberta. Within Alberta, the long-toed salamander has a limited breeding range, its subpopulations are isolated and discontinuous, and the species appears to be vulnerable to habitat disturbance. Threats to salamanders and their habitat include stocking breeding ponds with predatory fish, altering or destroying breeding ponds and adjacent forest habitat, and general disturbance of breeding ponds.

The Initial Conservation Action Statement (ICAS) indicated the need to actively manage breeding sites and enhance data collection on population size, distribution and trends. The status will be reassessed within five years. In response to the ICAS, a draft conservation plan has been developed.

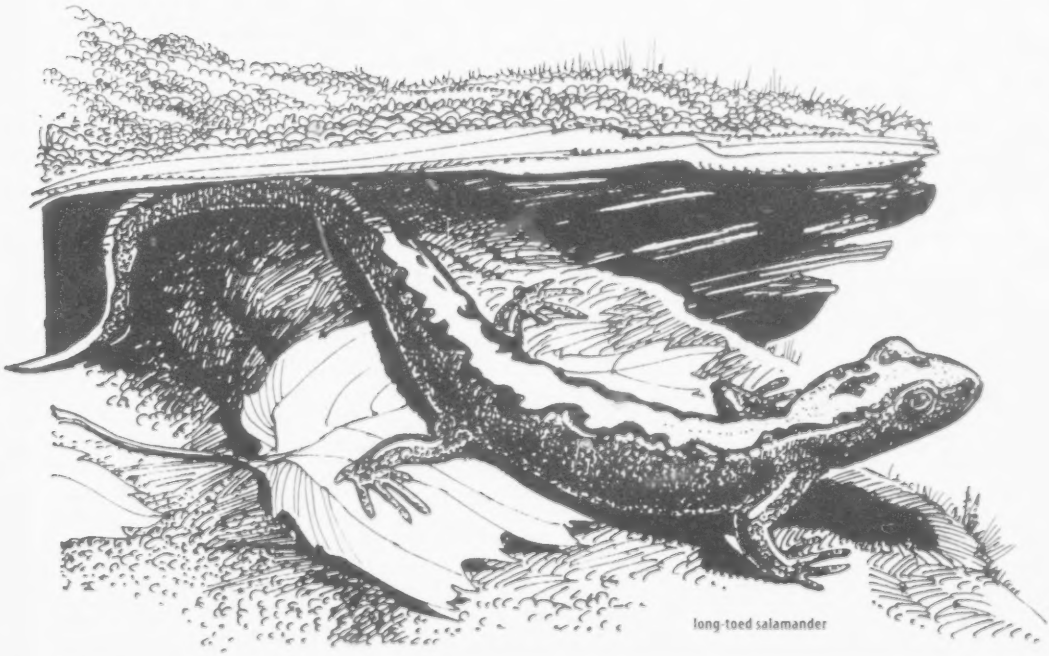
Goal

Maintain the current distribution and population of long-toed salamanders in Alberta.

Objectives

1) *Monitoring and assessment:* Maintain long-term monitoring to understand population distribution and trends.
2) *Habitat protection:* Identify habitat requirements and instigate appropriate habitat management for both breeding and non-breeding habitat.
3) *Education and communication:* Continue public education and communication with industry and landowners.

The plan outlines site-specific monitoring and management activities in the context of the current provincial amphibian monitoring program, including both long-term monitoring of key breeding sites and survey efforts to identify new subpopulations. It also emphasizes the need for immediate protection of breeding ponds and surrounding forest habitat through management activities appropriate to the land disposition. Public education and communication with industry and landowners regarding wetland conservation is recommended.



long-toed salamander

For more information contact:

Lisa Wilkinson (*see page 7*).

PRAIRIE RATTLESNAKE CONSERVATION MANAGEMENT PLAN

Staff Lead: **Joel Nicholson**

Background

In Alberta, the Endangered Species Conservation Committee has designated the prairie rattlesnake (*Crotalus viridis*) as *Data Deficient*, owing to a lack of data on population size and trends. An accumulation of anecdotal evidence suggests that the Alberta population of prairie rattlesnakes has declined during the last 20 years. These declines are thought to be the results of historical human persecution and continuing habitat loss and degradation. The population may currently be in decline, but the extent and rate of that decline is not known. Increasing urbanization and agricultural and industrial activities in southeastern Alberta threaten the remaining native habitat for this species and increase negative human-snake interactions, such as road mortalities. Based on the probability of further decline of the prairie rattlesnake population in Alberta, a conservation management plan is under development that will outline key issues and strategies for conserving this species.

Goal

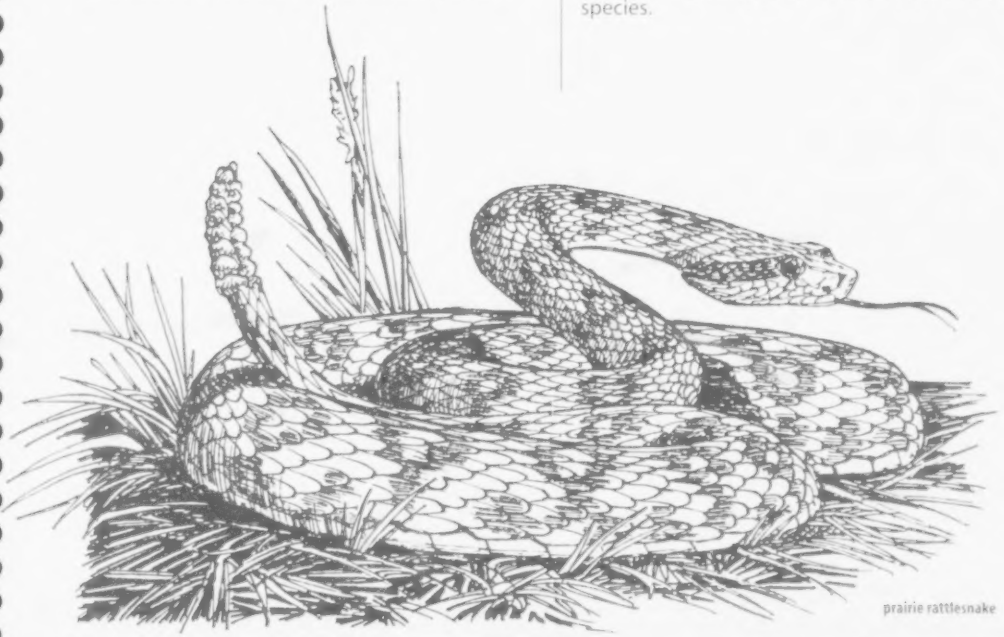
To determine the current status of the prairie rattlesnake in Alberta and to maintain its current distribution and population.

Objectives

Four key issues will be highlighted in the conservation management plan for prairie rattlesnakes:

- *Determine the size of the population of prairie rattlesnakes in Alberta.* It is necessary to provide baseline data on the numbers of rattlesnakes in the province, to establish whether the population is currently in decline. This information will also inform future status assessments of this species.
- *Determine the habitat requirements of this species in order to delineate key habitat and to inform land use decisions.* Determine how land use and habitat fragmentation affect rattlesnake movement, behaviour, foraging success and gene flow; use the information to inform land use decisions.
- *Determine the impact of road mortality on the Alberta population of rattlesnakes.* Increasing urbanization and agricultural and industrial activity in Alberta has led to an increase in the number of roads intersecting rattlesnake habitat and to an increase in traffic intensity on these roads. A large number of snakes are killed on roads as they disperse from dens to upland habitat. Further study using standardized methods to examine timing, location and number of mortalities, and how these relate to traffic intensity and road type, is needed to determine the impact that road mortality has on rattlesnake populations and to determine appropriate mitigation measures (e.g., snake crossing signs).
- *Use outreach and extension efforts to increase public appreciation for prairie rattlesnakes.* These efforts should alleviate some of the public's concern over the venomous nature of this species and decrease incidents of human persecution.

It is anticipated that the implementation of these strategies will provide the information needed to determine the status of the prairie rattlesnake in Alberta and to help prevent further declines of this species.



prairie rattlesnake

For more information contact:

Joel Nicholson (see page 7).

SPRAGUE'S PIPIT CONSERVATION MANAGEMENT PLAN

Staff Lead: **Dave Prescott**

Background

The Sprague's pipit (*Anthus spragueii*) is a *Species of Special Concern* in Alberta, and is listed as *Threatened* by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC 2003). Although the species is relatively common in southern Alberta, the Sprague's pipit is considered to be of management concern because of rapidly declining populations and dependence on native grasslands, which are being lost at a rapid rate. In October 1999, the Endangered Species Conservation Committee created an Initial Conservation Action Statement recommending that 1) the Sprague's pipit be identified as *Sensitive* (now referred to as *Species of Special Concern*) in Alberta, and 2) Alberta Environment (now Alberta Sustainable Resource Development) should develop appropriate mechanisms to identify and implement conservation and management of *Sensitive* species in general, and the Sprague's pipit in particular.

Goal

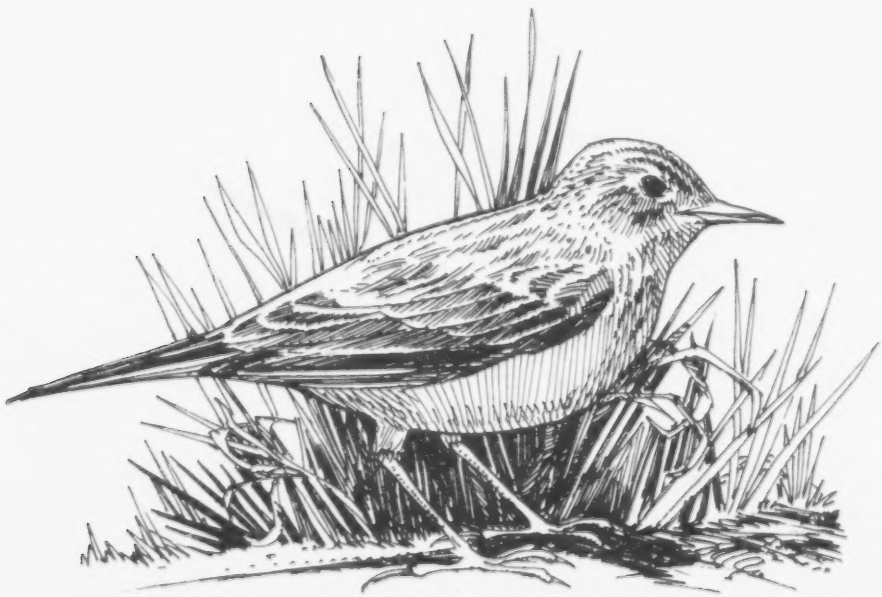
To maintain current distribution and population of Sprague's pipits.

Objectives

In 2002, a draft management plan was prepared to guide the management of Sprague's pipits in Alberta, through the following objectives:

- maintain long-term monitoring efforts,
- preserve or improve the quality or quantity of breeding habitat in the province,
- raise the profile of the Sprague's pipit as a species at risk in Alberta through public education and communication with industry and landowners.

Because the Sprague's pipit is dependent on the presence of native grassland habitats, management efforts must aggressively focus on preventing the further loss of these habitats, and on ensuring the appropriate quality of the existing grasslands. Such efforts would have benefits for a broad range of prairie flora and fauna that depend on similar habitats. Many of these species are already at risk in Alberta, or in Canada as a whole.



Sprague's pipit

For more information contact:

Dave Prescott (*see page 7*).

recovery planning

One of the most important components of Alberta's Species at Risk Program is the development and implementation of recovery plans for some species at risk. The overall goal of the recovery program is to restore species identified as *Threatened* or *Endangered* to viable, naturally self-sustaining populations within Alberta. Recovery plans will be completed for Alberta species that are designated as *Threatened* or *Endangered*. Developing these plans reflects Alberta's commitment to the *Accord for the Protection of Species at Risk in Canada*, the *National Framework for the Conservation of Species at Risk*, and requirements established under Alberta's *Wildlife Act* and the federal *Species at Risk Act*.

Alberta recovery plans are developed under the supervision of the Fish and Wildlife Division, Alberta Sustainable Resource Development. These recovery plans are prepared by recovery teams composed of a variety of stakeholders, which may include government agencies, conservation organizations, industry, landowners, resource users, universities and others. Membership is by invitation from the Director of Wildlife Management in the Department of Sustainable Resource Development and includes appropriate representation from the diversity of interests unique to each species and circumstance.

Recovery plans consist of two main components: a recovery strategy and an action plan. The strategy includes a comprehensive compilation of both short- and long-term goals and objectives, as well as general approaches and strategies required for recovery of the particular *Threatened* or *Endangered* species. The action plan identifies specific actions and timelines necessary to achieve the recovery goals. Conservation and management of these species continues during preparation of the recovery plan.

Once a draft recovery plan is completed, it is forwarded to the Endangered Species Conservation Committee (ESCC) for review. The ESCC then forwards recommendations and advice on implementation and recovery actions to the Minister of Sustainable Development. Interested members of the public are also provided with an opportunity to comment on the plan during the final stage of plan completion. Plans accepted and approved for implementation by the Minister are published as part of the recovery plan report series. Approved plans are a summary of the department's commitment to coordinate and implement conservation actions necessary to restore and maintain these species. Recovery plans are "living" documents and are revised by the recovery team as conditions change or circumstances warrant. Each approved plan includes a process for plan review and for monitoring the results of implementation.

With the approval of two recovery plans and several others near completion, priority is shifting toward the implementation stage of recovery for a number of species. Commitment by affected stakeholders and government is critical to the implementation of recovery activities. It is recognized that implementation will be subject to the identification of sufficient resources, both from within and outside government, and to the overall program priorities of the Alberta Government.

During 2002-2003, background recovery planning was initiated for trumpeter swan, Ord's kangaroo rat and four species found in southeastern Alberta: western spiderwort, soapweed, yucca moth and swift fox. Recovery teams for these species are expected to be formed in 2003. Recovery teams were formed for grizzly bear and woodland caribou, and a provincial recovery action group was formed for sage-grouse. These teams have met and are working on recovery plans. Recovery teams for burrowing owl and peregrine falcon expect to have the final recovery plans for these species ready in 2003. Substantial progress was made on implementation of recovery plans for western blue flag and piping plover. Recovery-related actions continued for all of these species, concurrent with recovery planning. On-the-ground initiatives varied from species to species, and included ongoing population monitoring and development and implementation of range management plans for grazing leases in select areas.

BURROWING OWL RECOVERY PLANNING

Recovery Team Leader: **Arlen Todd**

Background and Activities

The burrowing owl was first listed as *Threatened* under Alberta's *Wildlife Act* in 1987. This listing was upheld in 2000 following a review of the species' status. Nationally, the burrowing owl is listed as *Endangered* by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC 2003). The Alberta Burrowing Owl Recovery Team was formally established in June 2001 and the first meeting was held on 13 July 2001. The team had met seven times by the end of 2002-2003.

Team membership consists of a private citizen and representatives from Alberta Beef Producers, Alberta Sustainable Resource Development (Fish and Wildlife and Public Lands divisions), ConocoPhillips Canada Resources Corporation, Eastern Irrigation District, EnCana Corporation, Environment Canada, Grasslands Naturalists, Nature Conservancy Canada, Operation Grassland Community and Special Areas Board.

The team recognizes that landholders and resource users have vital roles to play in successful recovery efforts for burrowing owls, and is completing a recovery planning process that is inclusive and effective. A draft recovery plan has been completed, and is undergoing review and revisions by the burrowing owl team. It is expected that the plan will be finalized and submitted to the Director of Wildlife Management and the Endangered Species Conservation Committee during 2003.

For more information contact:

Arlen Todd (*see page 7*).

GREATER SAGE-GROUSE RECOVERY PLANNING

Recovery Team Leader: **Dale Eslinger**

Background and Activities

The greater sage-grouse has experienced substantial declines in population size and distribution throughout much of its range across the prairies, including Alberta and Saskatchewan. In 2000, the Committee on the Status of Endangered Wildlife in Canada reassessed the status of the prairie population of sage-grouse and upheld its 1998 designation of *Endangered* (COSEWIC 2003). During the same period, Alberta assessed the provincial status of the species and designated it as *Endangered* under Alberta's *Wildlife Act*.

The Sage-Grouse Recovery Team was formed in November 1997 to initiate recovery planning for the prairie population of sage-grouse. The interprovincial team followed Recovery of Nationally Endangered Wildlife (RENEW) guidelines in developing the recovery plan. Alberta endorsed the resultant *Canadian Sage Grouse Recovery Strategy* in September 2001.

The recovery strategy lists the primary recovery goal and related objectives, provides an overview of sage-grouse ecology and status, and outlines key recovery strategies. Alberta is now poised to develop a recovery action plan. The Sage Grouse Recovery Action Group has been formed and the first meeting was held on 22 January 2003. A student from the Environmental Design program at the University of Calgary is conducting interviews with all team members as part of her evaluation of the process, and the second meeting was held in March.

The team consists of local representation from the ranching community, Canadian Association of Petroleum Producers, naturalists, hunters and Alberta Sustainable Resource Development. A technical resource group has also been formed, which consists of specialists that will report to the team, assist with scientific reports and provide other information needed to develop an implementation plan for sage-grouse recovery.

The *Canadian Sage Grouse Recovery Strategy* is available on the Alberta Species at Risk Program web site: http://www3.gov.ab.ca/srd/fw/riskspecies/.

For more information contact:

Dale Eslinger (Dale.Eslinger@gov.ab.ca).

GRIZZLY BEAR RECOVERY PLANNING

Recovery Team Leader: **Lisa Wilkinson**

Background and Activities

In April 2002, the Minister of Sustainable Resource Development, upon review of the recommendation from the Endangered Species Conservation Committee to list the grizzly bear as *Threatened*, requested more information on grizzly bear conservation and management. The Minister appointed a technical team to examine the current grizzly bear population model, improve the precision and the accuracy of the model, identify data gaps, and assess the feasibility of the annual hunt. The Minister also directed formation of a provincial grizzly bear recovery team to recommend goals, objectives and strategies for maintaining a healthy grizzly bear population in Alberta.

The Alberta Grizzly Bear Recovery Team is a multi-stakeholder team designed to represent a range of interests within Alberta. The team consists of representatives from the following: Alberta Energy, Alberta Fish and Game Association, Alberta Forest Products Association, Alberta Sustainable Resource Development (Fish and Wildlife, Land and Forest, and Public Lands divisions), Canadian Association of Petroleum Producers, Federation of Alberta Naturalists, environmental nongovernmental organizations (Alberta Wilderness Association, Grizzly Bear Alliance, Canadian Parks and Wilderness Society, Yellowstone to Yukon Conservation Initiative), Parks Canada, University of Alberta, University of Calgary and Western Stock Growers Association.

The team is responsible for preparing and overseeing implementation and evaluation of a recovery plan for grizzly bears in Alberta. The team is also responsible for updating the plan and reporting on the progress of the recovery efforts. The life span of the plan is five years; during that period the recovery team will meet at least annually to review and update the plan as required, and at the end of five years the plan will be reassessed.

The team is currently working on a draft of the plan, and hopes to have a document ready for submission to the Minister by early 2004.

For more information contact:

Lisa Wilkinson *(see page 7)*.

ORD'S KANGAROO RAT RECOVERY PLANNING

Recovery Team Leader: **Arlen Todd**
Co-chair: **Brent Smith** (CFB Suffield)

Background and Activities

The Ord's kangaroo rat was first listed as *Endangered* under Alberta's *Wildlife Act* in June 2002. This designation was based on the small breeding population (<1000 adults) of Ord's kangaroo rat, with dramatic within-year fluctuations in population size, the species' geographical isolation from other kangaroo rat populations and its being limited to restricted habitat within Alberta. Nationally, Ord's kangaroo rat is listed as *Special Concern* by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC 2003).

The interim leader of the Ord's Kangaroo Rat Recovery Team in Alberta, Dale Eslinger (Fish and Wildlife Division), researched potential team membership, and organized a preliminary meeting of some prospective members on 14 August 2002 at Ralston, in Canadian Forces Base (CFB) Suffield. About two-thirds of the Alberta range of the kangaroo rat is contained within CFB Suffield. Arrangements have been made to have CFB Suffield provide a co-chair for the recovery team. A summary document of the biology of Ord's kangaroo rat was produced for the recovery team using information in the literature and by consulting with a species specialist.

For more information contact:

Arlen Todd *(see page 7)*.

PEREGRINE FALCON RECOVERY PLANNING

Recovery Team Leader: **Gordon Court**

Background and Activities

Nationally, the peregrine falcon is listed as *Threatened* by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC 2003). In 1999, its status in Alberta was downgraded from *Endangered* to *Threatened* in recognition of increasing populations in the province and declining organochlorine pesticide residues in peregrines and their prey. Along with this new listing, recovery and conservation actions in the province were formally initiated. These actions included the formation of a multi-stakeholder recovery team and creation of a recovery plan.

In May 2001, the Minister of Sustainable Resource Development initiated the establishment of the Alberta Peregrine Falcon Recovery Team. The team's primary responsibility is to facilitate and coordinate the conservation and recovery of this species in Alberta. It provides expert advice to the Minister on all matters relating to the management of this falcon in the province. The team is also responsible for writing, updating, and guiding the implementation of the provincial recovery plan, and for providing input to the national peregrine recovery team on matters relating to peregrine falcon management in Alberta.

Affected stakeholders were invited to participate on the recovery team, and team membership consists of representatives from Alberta Conservation Association, Alberta Sustainable Resource Development—Fish and Wildlife Division, Canadian Wildlife Service, Parks Canada—Wood Buffalo National Park, and the Federation of Alberta Naturalists.

In consideration of budget constraints and the distance between residences of members on the team, recovery team meetings have been conducted by teleconference. Pesticide residues continue to be monitored in the species through opportunistic collections of eggs each year in Alberta. Also, a memorandum of agreement has been drawn up between Alberta Sustainable Resource Development, Parks Canada and the Canadian Wildlife Service to expedite monitoring initiatives in northeastern Alberta. These agencies, and the Alberta Conservation Association, are committed to a province-wide peregrine falcon survey in 2005.

The *Alberta Peregrine Falcon Recovery Plan* will be completed by late 2003. The plan is an action-oriented document; however, it recognizes the realities of soliciting or committing Species At Risk funds toward a species regarded as "in recovery", particularly one that has been the focus of management activities for more than three decades. The plan outlines a strategy to document recovery and outlines a modest commitment to a monitoring plan that should identify whether conservation actions are still required to assist this species in Alberta.

Following the completion of each year's activities, plan accomplishments will be assessed and future recovery direction and initiatives will be re-evaluated as deemed necessary by the recovery team.

For more information contact:

Gordon Court *(see page 7)*.

TRUMPETER SWAN RECOVERY PLANNING

Recovery Team Leader: **Mark Heckbert**

Background and Activities

The trumpeter swan was first listed as *Endangered* under Alberta's *Wildlife Act* in 1987. In 1997, when the endangered list was subdivided into *Endangered* and *Threatened*, this species was further classified as *Threatened*. The status of the trumpeter swan was reviewed in 2001, and the designation of *Threatened* was reaffirmed. This decision was based on the small population size (668 subadult/adult birds) and concerns about the security of the very limited wintering habitat in the United States. Nationally, the trumpeter swan is listed as *Not At Risk* by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC 2003).

Invitations were sent out to potential recovery team members in February 2003, and the Alberta Trumpeter Swan Recovery Team formed in April 2003. Team membership consists of a private citizen and representatives from Alberta Energy, Alberta Energy and Utility Board, Alberta Sustainable Resource Development (Fish and Wildlife, Land and Forest and Public Lands divisions), Canadian Wildlife Service, County of Grande Prairie, Ducks Unlimited Canada, Elk Island National Park, Nature Conservancy Canada, Peace Parkland Naturalists, Trumpeter Swan Society and the University of Alberta. Work towards a recovery plan for trumpeter swan will continue in 2003-2004.

For more information contact:

Mark Heckbert
(Mark.Heckbert@gov.ab.ca).

WOODLAND CARIBOU RECOVERY PLANNING

Recovery Team Leader: **Dave Hervieux**

Background and Activities

The provincial recovery planning process for woodland caribou in Alberta was initiated in response to a reaffirmation of the species' legal designation as *Threatened* in Alberta, under the provincial *Wildlife Act*, in September 2001. This status was recommended by the Endangered Species Conservation Committee on the basis of continuing woodland caribou population and distribution declines, small population size, dependency on older forest, and sensitivity to human activities. At the direction of the Minister of Sustainable Resource Development, the Alberta Woodland Caribou Recovery Team was officially formed in the fall of 2002.

In 2002, the southern mountain and boreal populations of woodland caribou were listed nationally as *Threatened* by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC 2003). The provincial recovery process for woodland caribou has been designed to meet provincial requirements for recovery planning, as well as national requirements under the *Accord for the Protection of Species at Risk* and the federal *Species At Risk Act*.

The recovery team is a multi-stakeholder group consisting of representatives from organizations interested in or affected by the management of caribou and its habitat: Alberta Energy, Alberta Forest Products Association, Alberta Pacific Forest Industries, Boreal Caribou Committee, Alberta Sustainable Resource Development (Fish and Wildlife and Public Lands divisions), Canadian Association of Petroleum Producers, Federation of Alberta Naturalists, Parks Canada and the University of Alberta. The team met five times during 2002-2003, with the first meeting held in October 2002.

The team is developing a recovery plan that will detail the actions and commitments necessary to restore woodland caribou populations in Alberta, and allow the species' removal from the list of provincially threatened species. It is the team's belief that recovery of caribou is both biologically and technically feasible, and that research and planning exercises over the past decade have laid the groundwork necessary for recovery.

A number of guiding principles will help shape recovery efforts for this species. Of primary importance is the underlying assumption that stakeholders who use and manage the land within caribou range are committed to the goal of caribou recovery. The recovery team will be emphasizing an ecosystem-based approach to developing recovery strategies and actions, and advocates an adaptive management approach during implementation of those actions. It is recognized that effective recovery strategies that are economically and logistically feasible, and which support the long-term sustainability of caribou herds, must be developed.

The recovery team will continue to meet in 2003 and anticipates that the recovery plan will be finalized in early 2004.

For more information contact:

Dave Hervieux
(Dave.Hervieux@gov.ab.ca).

RECOVERY PLANNING FOR PLANT AND ANIMAL SPECIES AT RISK IN SOUTHEASTERN ALBERTA

Program Supervisor: **Joel Nicholson**

Background and Activities

Background recovery planning for western spiderwort, soapweed, yucca moth and swift fox began in 2002.

Western spiderwort (*Transcantia occidentalis*) is a flowering plant found in one location in southeastern Alberta. In August 2001, the Endangered Species Conservation Committee (ESCC) recommended that western spiderwort be designated as *Endangered* in Alberta because of its restriction to only one site in the province and because this population is geographically separated from other spiderwort populations in Canada and the United States. Nationally, western spiderwort has been designated as *Threatened* by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC 2003).

Recovery planning also began for soapweed (*Yucca glauca*), a flowering plant found in southeastern Alberta, and for yucca moth (*Tegeticula yuccasella*), its only pollinator. Soapweed and yucca moth have an obligate relationship such that neither can survive and reproduce without the other. In 2002, the ESCC recommended that these species be listed as *Endangered*. Soapweed is found at only two locations within Alberta, and the status recommendation for this species was based on its limited distribution. In addition, soapweed appears to be declining in Alberta and is isolated from soapweed populations in the United States. Similarly, yucca moth appears to be declining in Alberta and is also isolated from moth populations in the United States. Nationally, the Committee on the Status of Endangered Wildlife in Canada lists soapweed and yucca moth as *Threatened* and *Endangered*, respectively (COSEWIC 2003).

Finally, recovery planning began for the swift fox (*Vulpes velox*). Once extirpated from Canada, the swift fox was reintroduced to Alberta and Saskatchewan in the early 1980s. In 2000, the swift fox was listed as *Endangered* in Alberta because of its small population size (<100 individuals). COSEWIC also designates the swift fox as *Endangered* in Canada (COSEWIC 2003).

For each of these species, a summary of their biology has been produced and will be used in the development of recovery plans. Formation of these recovery teams is anticipated in late 2003-2004.

swift fox

For more information contact:

Joel Nicholson (*see page 7*).

PIPING PLOVER RECOVERY IMPLEMENTATION, YEAR 1

Recovery Team Leader: **Dave Prescott**

Background and Activities

The piping plover is an endangered species in Alberta, and in most other jurisdictions in North America where it occurs. In 2000, the Minister of Sustainable Resource Development (SRD) formed a 10-member provincial recovery team, with representation from SRD (Fish and Wildlife and Public Lands divisions), Canadian Wildlife Service, Alberta Conservation Association, Alberta Beef Producers, Ducks Unlimited Canada, Special Areas Board and Nature Conservancy Canada. In February 2002, the team submitted the *Alberta Piping Plover Recovery Plan 2002-2004* for review by the Minister. The plan was approved in April 2002.

The plan sets three goals: 1) a well-distributed population of 300 breeding adults in the province; 2) reproductive success of at least 1.25 chicks per pair annually; and 3) no net loss of breeding habitat. These goals will be achieved through the protection of habitat and nests in Alberta in accordance with guiding principles established by the recovery team. This report summarizes activities completed to achieve these goals in the first year of plan implementation (2002-2003).

Plan Management and Administration

- Implementation was coordinated from the Fish and Wildlife Division office in Red Deer. Staff from the Alberta Conservation Association (ACA) in Edmonton and Red Deer coordinated much of the summer field program.
- Staff were hired to lead stewardship activities out of Red Deer, with support from the North American Waterfowl Management Plan (NAWMP) and Environment Canada (Habitat Stewardship Program).
- Summer field staff were trained and supervised by the ACA.
- Plover data were entered into several key databases, including the Biodiversity/Species Observation Database.

Habitat Management and Protection

- A review of all quarter sections and lakes in the province where plovers are known to have occurred through 2001 was completed. Piping plovers were found to have occupied 75 lakes in Alberta, within at least 208 distinct quarter sections of land. Tenure of these lands is approximately evenly split between private (75 different landowners) and public ownership.
- Protective notations were applied for on 40 quarter sections of provincial crown land outside of the Special Areas known to have supported piping plovers.
- Notations on 95 quarter sections within Special Areas were appended to the Special Areas Management System.
- A summary of all known plover breeding sites was circulated to Fish and Wildlife Division biologists for use in the industrial referral process.
- Concise management plans were completed for 25 key piping plover lakes in the province. These plans form the basis of subsequent management actions on each lake.
- Staff from Fish and Wildlife Division, Alberta Conservation Association, Alberta Environmentally Sustainable Agriculture, Ducks Unlimited Canada and Nature Conservancy Canada personally visited at least 26 landowners to discuss plover management opportunities.
- A survey of 68 cottage owners on Muriel Lake and six owners on West Reflex Lake was conducted to determine their knowledge of piping plovers, and to seek their input on potential management and access restrictions on their lakes. Results were overwhelmingly positive.
- An application was submitted to the Minister of Sustainable Resource Development for establishment of a seasonal sanctuary to protect two critical nesting areas on Muriel Lake.
- Seven agreements were signed with landowners or other groups to initiate specific on-the-ground recovery activities:
  - Establishment of a rotational grazing system on the east shore of Beaverhill Lake, with cooperation from two landowners and Public Lands Division.

- Establishment of a managed grazing system to reduce grazing impacts on the western shore of Red Deer Lake, with the cooperation of a landowner and Public Lands Division. Management of this area also includes the spreading of gravel to increase the amount of nesting habitat available in an area subjected to extensive vegetation encroachment.
- A partnership with landowners to fence the entire east side of Handhills Lake to reduce cattle impact on the shoreline.
- Erection of fencing on the west side of Handhills Lake (with cooperation of the landowner and the Special Areas Board) to manage cattle access to the lakeshore.
- A partnership with Alberta Community Development to develop interpretive signage at three provincial parks (Miquelon, Gooseberry and Dillberry) that are in or near known nesting areas.
- A partnership with the Grassland Naturalists Society and the Medicine Hat Interpretive Program to develop a mobile interpretive display focusing on piping plover issues in southern Alberta, with emphasis on Chappice Lake.
- An agreement with Ducks Unlimited Canada and a local landowner to modify the configuration of a boat launch, erect interpretive signage, and cost-share watering sites to manage grazing around key piping plover nesting beaches on West Reflex Lake.

Productivity Enhancement

- A new, highly portable exclosure design that was initially tested in 2001 was used across the province in 2002. In total, 46 nests were protected with exclosures, with 98% hatching success. This greatly exceeded the less than 50% nest success that had been documented for unmanaged nests over the past decade in Alberta.
- A comprehensive review of all available techniques for managing predator populations was completed. New options for non-lethal control of avian and mammalian predators may be employed following review by the recovery team.
- The annual removal of stick nests to reduce the incidence of nesting by predatory birds (primarily crows, magpies and merlins) near key piping plover nesting beaches was undertaken during the nonbreeding season on three lakes (West Reflex, Killarney and Red Deer). Approximately 135 nests were removed.

Information and Education

- Signs were designed and produced, with the goal of minimizing all-terrain vehicle use on nesting lakes.
- Presentations focusing in whole or in part on piping plover management issues were given to a variety of groups in 2002-2003, including: Alberta's Endangered Species Conservation Committee, Prairie Piping Plover Recovery Team, Destination Conservation, Central Alberta Grazing Association, Prairie Farm Rehabilitation Association, Baxter Lake landowners, ACA Partners in Conservation Conference, NAWMP Biodiversity Conference.
- Formal training sessions were held for staff of partner agencies on Birch and Handhills lakes. All affected agencies were invited to participate in plover activities, and over 75 people were given "hands-on" experience with plovers in their natural surroundings.
- A new brochure on piping plovers was produced, as part of a provincial series.
- A landowner information package, including development of a new folder, was produced. This folder was used as a key communications vehicle during personal visits to landowners.

Research

- Aerial surveys identified suitable habitat on several previously unsurveyed water bodies. Subsequent ground surveys identified a new breeding location on McGregor Lake.
- Complete surveys of breeding plovers were conducted on 46 lakes. In total, 141 birds were found on 19 lakes in 2002.
- Ninety-nine young birds were banded. Twenty-nine previously banded birds were sighted during the year (originally banded in Alberta, Saskatchewan or Texas), and at least 12 Alberta-banded birds were sighted on the wintering grounds in Texas.
- Tissue samples were collected for inclusion in a genetics study coordinated by Canadian Wildlife Service and United States Fish and Wildlife Service.
- Data on nesting success collected since 1994 were compiled into a single database. Analysis of nesting success, cause of nest failure, fledging success and impacts of various management tools is underway.

Funding

- Numerous funding applications resulted in approximately $135 000 being raised from Fish and Wildlife Division, Alberta Conservation Association, Environment Canada (Habitat Stewardship Program and the Canadian Wildlife Service), Alberta North American Waterfowl Management Plan, Department of National Defence, Endangered Species Recovery Fund, TD Friends of the Environment Foundation, Human Resources Development Canada, and Alberta Human Resources and Employment.

- Substantial in-kind contributions from Alberta Community Development, Alberta Conservation Association, Ducks Unlimited Canada, Alberta Environmentally Sustainable Agriculture, Public Lands Division, private landowners and lessees, and other partners added significant resources to recovery efforts in 2002-2003.

Looking Ahead

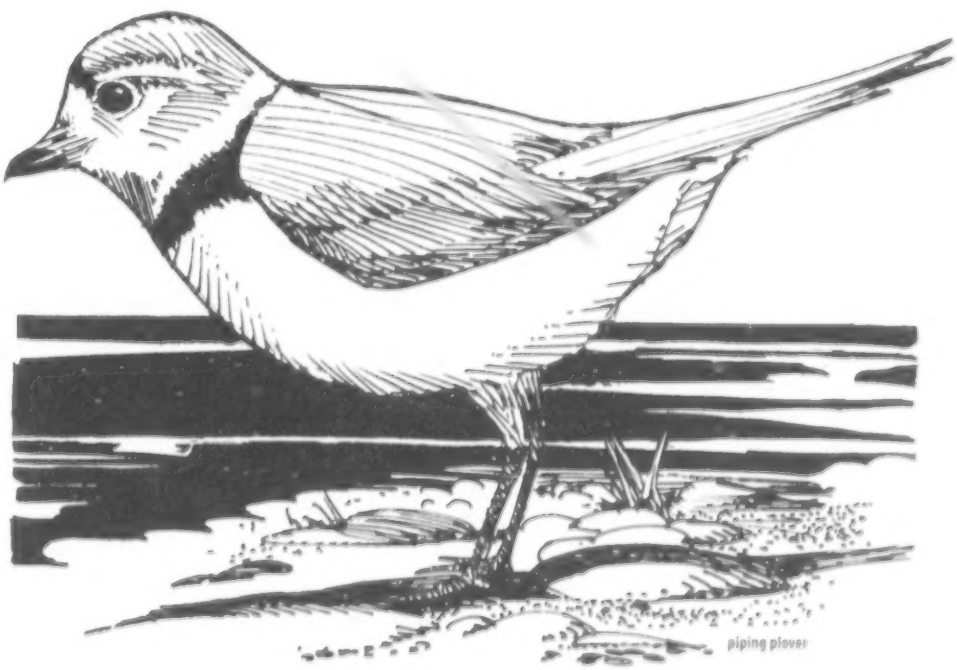
All tasks scheduled for completion in the first year of implementation were accomplished successfully. Work in 2002-2003 also laid the foundation for several new habitat management projects to be initiated in 2003-2004. The activities detailed in the *Alberta Piping Plover Recovery Plan, 2002-2004* for the second year of implementation remain essentially unchanged. Some key activities for the upcoming year will be the following:

- Broadening participation in recovery efforts through field training, presentations and landowner contacts.
- Continuing communication with landowners contacted in the first year of implementation.
- Broadening the funding base to include new partners.
- Exploring opportunities for further enhancement of piping plover productivity.
- Expanding population monitoring and the predator exclosure program to as many areas as resources allow.
- Implementing activities outlined in the Lake Management Plans completed in 2002-2003.

Acknowledgements

The Alberta Piping Plover Recovery Team gratefully acknowledges all individuals and agencies that funded (see "Funding" above) or actively participated in our work during the past year. We particularly value the cooperation of the numerous landowners who partnered in our efforts to protect piping plovers and their breeding habitat, or allowed us access to their land for monitoring activities. Their continuing stewardship is vital to the recovery of the piping plover and other species at risk in Alberta.

Management of the endangered piping plover is guided by the Alberta Piping Plover Recovery Team, which is composed of representatives from Alberta Beef Producers, Alberta Conservation Association, Alberta Sustainable Resource Development, Ducks Unlimited Canada, Environment Canada, Nature Conservancy Canada and Special Areas Board.



piping plover

For more information contact:

Dave Prescott (*see page 7*). Several reports and the provincial recovery plan are available at: http://www3.gov.ab.ca/srd/fw/riskspecies/index.html.

WESTERN BLUE FLAG MAINTENANCE AND RECOVERY IMPLEMENTATION, YEAR 1

Recovery Team Leader: **Richard Quinlan**

Background and Activities

The first annual review meeting of the Canada Western Blue Flag Maintenance/Recovery Team was held in July 2003. The purpose of the meeting was to review progress made on the implementation schedule of the action plan in the *Maintenance and Recovery Plan for Western Blue Flag (*Iris missouriensis*) in Canada*. This annual report is based upon that meeting and summarizes the activities leading up to ministerial approval of the plan, the accomplishments during the first year of plan implementation in 2002-2003, and planned activities for the coming year.

Plan Approval

- The *Maintenance and Recovery Plan for Western Blue Flag (*Iris missouriensis*) in Canada* was provided to the Endangered Species Conservation Committee (ESCC) in February 2002, and later that month, a presentation summarizing the plan was made to the ESCC. The ESCC recommended to the Minister of Sustainable Resource Development in late March that the plan be approved, and in mid-April, the Minister of Sustainable Resource Development approved the plan as submitted by the Canada Western Blue Flag Maintenance/Recovery Team. The plan is approved as the Alberta recovery plan for this species.
- A request was made from the Fish and Wildlife Division to Environment Canada that the plan also be accepted as the National Recovery Plan for western blue flag. This designation was delayed due to the process surrounding approval of the federal *Species at Risk Act* (SARA). The SARA received royal assent in December 2002, which led to a multi-stage approval of the act. Most sections of the SARA came into effect on 5 June, 2003. Under the SARA, western blue flag is a *Threatened* species. The act emphasizes the protection of *Threatened* species through collaborative efforts. The SARA also requires a national recovery plan for western blue flag (and other *Threatened* species) by 5 June 2007. The plan was subsequently resubmitted to Environment Canada in July 2003 for approval as the national recovery plan for western blue flag.

Public Outreach

- The western blue flag maintenance and recovery plan was printed as Report #1 in a new recovery plan report series.
- Copies of the plan were distributed at the Remington Carriage Centre, Fish and Wildlife Division offices, and by members of the recovery team.
- A public open house was held at the Remington Carriage Centre in Cardston in late May 2002.
- A poster display describing the project was produced. The display was set up at the public open house, at two conferences, and during Wildlife Week in Lethbridge.
- In summer 2002 the western blue flag maintenance and recovery plan was posted on the Alberta Species at Risk web site: http://www3.gov.ab.ca/srd/fw/riskspecies/.
- The interpretive program at Police Outpost Provincial Park was to be amended to include information on western blue flag. This did not occur because all interpretive services in the park were cancelled. Preliminary discussions have taken place regarding a volunteer role in delivering this action item. A species at risk sign, which describes western blue flag, has been erected at the park, and the most recent information brochure on the park includes a photograph of western blue flag.

Regulations

- In January 2002 the recovery team sent recommendations to the Director of Wildlife Management, regarding development of regulations under the *Wildlife Act* specific to western blue flag. These recommendations were also included in the recovery plan, and were subsequently considered during the development of draft regulations. Regulations have been drafted and are now under review. Upon ministerial approval of the regulations, the western blue flag will also be formally legislated as a *Threatened* species under Alberta's *Wildlife Act*.
- A formal review of the status of western blue flag by the ESCC's Scientific Subcommittee (SSC) has not yet taken place. During 2002, several new sites were inventoried, and this information will be provided to the SSC for a status review in the coming year.

Western Blue Flag Inventory and Monitoring

- A summary of the 2002 inventory of western blue flag is contained in the publication by Reg Ernst titled *Inventory and Monitoring Protocol for Naturally Occurring Western Blue Flag (*Iris missouriensis*) in Alberta*. The 2002 total stem count estimate was approximately 70 000, with all sites located in a 300-km^2 area south of Cardston. A monitoring program was initiated in 2002 and will continue in 2003.

Range Management Plans and Improvements

- A total of eight landowners who have western blue flag on their land have taken advantage of the Western Blue Flag Conservation Program, which is administered by the Alberta Conservation Association (ACA). The program contracts the services of an independent range consultant to do a range inventory of all property held by the participant, and to consult with the producer on ways to improve ranch management. The consultant then produces a range management plan, which includes recommendations for maintaining western blue flag. Six range management plans have been completed and two are underway. There are three additional landowners, two of which may choose to participate. The third landowner has chosen not to participate, but is working cooperatively with Nature Conservancy Canada to protect western blue flag habitat. Participation in the western blue flag conservation program is voluntary.
- Part of the range management plan includes recommendations for ranch improvements to benefit western blue flag and prairie conservation. Through discussions between ACA and ranchers, partner funding for several improvements has been arranged through the Western Blue Flag Conservation Program. Five ranchers have participated in this aspect of the program through development of watering facilities, fences and tame pasture seed.

Research

- Some research activities were recommended in the plan. Rangeland Conservation Service Ltd. was contracted to prepare a detailed report titled *Program Evaluation and Monitoring Plan for the Western Blue Flag Conservation Program*. This document reviews inventory and monitoring protocols for the western blue flag and recommends a monitoring process to evaluate the success of range management plans and improvements in achieving the desired objectives of conservation of the species and native prairie in general.
- Other identified research activities such as detailed evaluation of western blue flag ecology and DNA analysis of populations were not initiated in 2002-2003.

Activities for 2003-2004

- The Fish and Wildlife Division will continue to encourage Environment Canada to endorse the *Maintenance and Recovery Plan for Western Blue Flag* (Iris missouriensis) *in Canada* as the national recovery plan for the species. The maintenance and recovery team will be involved in the drafting of any amendments.
- Alberta regulations for western blue flag have been developed in draft format and will be conveyed through the process for ministerial approval. These regulations will be consistent with the recommendations in the recovery plan.
- The SSC will be provided with the latest inventory information for western blue flag and asked to review the species' status.
- Inventory and monitoring activities identified in the recovery plan will continue in 2003 and 2004.
- Range management plans will be offered to new western blue flag landowners on a first-come priority basis as funds allow. Partnering with landowners on ranch improvements that enhance management of western blue flag and prairie conservation will also be done as funds allow.
- The program monitoring component of the *Program Evaluation and Monitoring Plan for the Western Blue Flag Conservation Program* will be implemented to provide tracking of management changes and the effect of those changes on western blue flag. This will provide a system to evaluate effectiveness of the cooperative voluntary involvement of landowners as opposed to the use of mechanisms such as legal agreements.
- Research institutions will be encouraged to recruit a graduate student interested in working on the ecology of western blue flag.

The next annual meeting for the Canada Western Blue Flag Maintenance/Recovery Team will be held during the summer of 2004.

For more information contact:

Richard Quinlan (*see page 7*).
Several reports and the provincial recovery plan are available at: http://www3.gov.ab.ca/srd/fw/riskspecies/index.html.

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Alberta Species at Risk Program
http://www3.gov.ab.ca/srd/fw/riskspecies/

Alberta Conservation Association (ACA)
http://www.ab-conservation.com/

Alberta Endangered Species Conservation Committee (ESCC)
http://www3.gov.ab.ca/srd/fw/escc/

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http://www.cd.gov.ab.ca/preserving/parks/anhic/

Map of the Natural Regions and Subregions of Alberta
http://www.cd.gov.ab.ca/preserving/parks/anhic/natural_regions_map.asp

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Committee on the Status of Endangered Wildlife In Canada (COSEWIC)
http://www.cosewic.gc.ca/

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http://www.speciesatrisk.gc.ca/recovery/default_e.cfm

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http://www.sararegistry.gc.ca/default_e.cfm

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http://www.redlist.org/info/categories_criteria.html

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Status of Alberta Wild Species Ranks (after *The General Status of Alberta Wild Species 2000* [Alberta Sustainable Resource Development 2001])

2000 Rank	1996 Rank	Definitions
At Risk	Red	Any species known to be at risk after formal detailed status assessment and designation as Endangered or Threatened in Alberta.
May Be At Risk	Blue	Any species that may be at risk of extinction or extirpation, and is therefore a candidate for detailed risk assessment.
Sensitive	Yellow	Any species that is not at risk of extinction or extirpation but may require special attention or protection to prevent it from becoming at risk.
Secure	Green	A species that is not at risk, may be at risk or sensitive.
Undetermined	Status Undetermined	Any species for which insufficient information, knowledge or data is available to reliably evaluate its general status.
Not Assessed	n/a	Any species whose general status has not been evaluated.
Exotic/Alien	n/a	Any species that has been introduced as a result of human activities.
Extirpated/Extinct	n/a	Any species no longer thought to be present in Alberta (extirpated) or no longer believed to be present anywhere in the world (extinct).
Accidental/Vagrant	n/a	Any species occurring infrequently and unpredictably in Alberta; i.e., outside its usual range.

Alberta's *Wildlife Act*[1]

Endangered Species	A species that is facing imminent extirpation or extinction if limiting factors are not reversed.
Threatened Species	A species likely to become endangered if limiting factors are not reversed.
Species of Special Concern	A species with characteristics that make it particularly sensitive to human activities or natural events.

[1] Draft wording as proposed for the Wildlife Amendment Act

Committee on the Status of Endangered Wildlife in Canada

(after http://www.cosewic.gc.ca/eng/sct0/terms_e.htm)

Extinct	A species that no longer exists.
Extirpated	A species that no longer exists in the wild in Canada, but occurs elsewhere.
Endangered	A species facing imminent extirpation or extinction.
Threatened	A species that is likely to become endangered if limiting factors are not reversed.
Special Concern (Vulnerable)	A species of special concern because of characteristics that make it particularly sensitive to human activities or natural events.
Not at Risk	A species that has been evaluated and found to be not at risk.
Data Deficient	A species for which there is insufficient scientific information to support status designation.

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